



MIC IP fusion 9000i

MIC-9502



BOSCH

en User Manual

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1 Browser connection

A computer with Microsoft Internet Explorer is used to receive live images, control the unit, and replay stored sequences. The unit is configured over the network using the browser.

1.1 Systems requirements

Our recommendations are:

- Computer with Intel Skylake processor or better
- Intel HD530 graphic card with performance that matches or is better than the resolution of the camera
- Windows 7 or later operating system
- Network access
- Internet Explorer version 11 or later

– or –

Application software, for example, Video Security Client, Bosch Video Client or Bosch Video Management System.

Note:

To see live images in your browser it might be necessary to download and install the MPEG-ActiveX from the Bosch download store.

1.2 Establishing the connection

The unit must have a valid IP address to operate on your network and a compatible subnet mask.

By default, DHCP is pre-set at the factory to **On plus Link-Local** so a DHCP server assigns an IP address or, if no DHCP server is available, a link-local address (auto-IP) is assigned within the range 169.254.1.0 to 169.254.254.255.

You can use IP Helper or Configuration Manager to find the IP address. Download the software from <http://downloadstore.boschsecurity.com>.

1. Start the Web browser.
2. Enter the IP address of the unit as the URL.
3. During initial installation, confirm any security questions that appear.

If a RADIUS server is used for network access control (802.1x authentication), you must configure the device before the device can communicate with the network.

To configure the device, connect it directly to a computer using a network cable and then set the service-level password.

Note:

If you cannot connect, the unit may have reached its maximum number of connections.

Depending on the device and network configuration, each unit can have up to 50 web browser connections, or up to 100 connections via Bosch Video Client or Bosch Video Management System.

1.3 Password protection in camera

The device is password-protected. The first time that any user accesses the device, the device will prompt the user to set a password at the service level.

The camera requires a strong password. Follow the prompts in the dialog box, which specifies what is required. The system measures the strength of the password that you enter.

When you use Configuration Manager to access your device for the first time, you must set the initial password of the device in Configuration Manager. The Users section (General > Unit Access > Users) displays the message, "Before you can use this device you have to secure it with an initial password."

Note: After you set the initial password, a "lock" icon appears next to the device name in the **Devices** list in Configuration Manager.

You can also launch the device webpage directly. In the device webpage, an initial password page appears, displaying input fields and a password strength gauge.






Enter the user name ("**service**") and a password in the appropriate fields. Refer to the section **User Management** for more information.

After a service-level password is set for the device, the device displays a dialog box that prompts users to enter the user name ("**service**") and the service-level password every time that they access the device.

1. Fill in the fields **User name** and **Password**.
2. Click **OK**. If the password is correct, the desired page appears.

2 System overview

When a connection is established, the **Live** page is initially displayed. The application bar displays the following icons:

	Live	To view the live video stream, click this icon.
	Playback	To play back recorded sequences, click this icon. This link is only visible if a storage medium has been configured for recording. (With VRM recording this option is not active.)
	Configuration	To configure the unit, click this icon.
	Links	To navigate to the Bosch download store, click this icon.
		To get context sensitive help for a particular page, click this icon.

Note: None of the pages are accessible until after you set a service-level password.

2.1 Live page

The **Live** page is used to display the live video stream and control the unit.

2.2 Configuration

The **Configuration** page is used to configure the unit and the application interface.

Making Changes

Each configuration screen shows the current settings. You can change the settings by entering new values or by selecting a predefined value from a list field.

Not every page has a **Set** button. Changes to pages without a **Set** button are set immediately.

If a page does show a **Set** button, you must click the **Set** button for a change to take effect.



Notice!

Save each change with the associated **Set** button.

Clicking the **Set** button saves the settings only in the current field. Changes in any other fields are ignored.

Some changes only take effect after the unit is rebooted. In this case, the **Set** button changes to **Set and Reboot**.

1. Make the desired changes.
2. Click the **Set and Reboot** button. The camera reboots and the changed settings are activated.

All settings are backed up in camera memory so they are not lost even if the power fails. The exception is the time settings, which are lost after 1 hour without power if no central time server is selected.

2.3 Playback

The **Playback** page is used for playing back recorded sequences.

3 Operation via the browser

3.1 Live page

3.1.1 Connection

Video

Select the appropriate camera from which to view live video.

Camera 1 is the visible image, and **Camera 2** is the thermal image.

Stream

Select the appropriate live video stream.

Stream 1

Select this option to display stream 1 of the camera.

Stream 2

Select this option to display stream 2 of the camera.

M-JPEG

Select this option to display the M-JPEG stream of the camera.

3.1.2 PTZ

Pan and tilt controls

- To tilt the camera up: Click and hold the up arrow.
- To tilt the camera down: Click and hold the down arrow.
- To pan the camera left: Click and hold the left arrow.
- To pan the camera right: Click and hold the right arrow.
- To pan and tilt the camera at the same time (variable pan/tilt): Click and drag the center area (that resembles a point stick or a trackball on a computer keyboard) around the PTZ control in the direction that you want to move the camera.



Notice!

If the camera will not pan in either direction, or pans in one direction only, refer to the “Error Codes” section of the manual.

Zoom

Click the + button to zoom in.
Click the - button to zoom out.

Iris

Click  (**Iris close**) to close the iris.

Click  (**Iris open**) to open the iris.

Focus

Click  to focus near.

Click  to focus far.

3.1.3


Pre-positions

The camera displays **Pre-position 1** through **Pre-position 6**. Select the appropriate pre-position to view the video image for that pre-position/scene. In the lower left of the video image, the OSD displays the Camera number (title), the Pre-position number, and the Pre-position number stored.

Below the list of pre-positions/scenes is a drop-down list showing the stored pre-positions/scenes.

Select the appropriate pre-position (1 through 6). Click  to store the pre-position.

Note: If the pre-position is already stored, a dialog box displays the message, “**Overwrite current pre-position?**” Click **OK** to overwrite, or click **Cancel** to cancel the operation.

Click  to display the selected pre-position in the video image.

3.1.4

AUX Control

With the tab **AUX Control** you can enter pre-programmed keyboard control commands. These commands are composed of a command number plus the appropriate function key (**Show pre-position**, **Set pre-position**, **AUX on**, or **AUX off**). A valid combination either issues a command to the device or displays an on-screen menu.

(Refer to the “Keyboard Commands” section of the manual for a list of all AUX commands for your camera.)

Show pre-position

Click this button to display a pre-position.

Set pre-position

Click this button to set a pre-position.

AUX on

Click this button to activate an AUX command.


AUX off

Click this button to deactivate an AUX command.

3.1.5

Intelligent Tracking

Options for tracking objects within the region of interest appear in the panel.

When Intelligent Tracking is active, the tracking icon  appears on the image along with the lines that track moving objects.

Select **Off**, **Auto** or **Click**. If **Click** is selected, click on an object to track it.

3.1.6

Special Functions

Scan 360°

Click this button to start a continuous 360° pan. To stop the continuous pan, click a directional control in the View Control tab.

Autopan

Click this button to pan the camera between user-defined limits.

Tour A / Tour B

Click one of these buttons to start the continuous playback of a recorded (guard) tour. A recorded tour saves all manual camera movements made during the recording, including its rate of pan, tilt and zoom speeds, and other lens setting changes.

To stop a tour, click a directional control in the View Control tab.

Note: **Tour B** is now intended for use with the 'IVA while moving' functions.

Focus

Click this button to activate the Auto Focus One Push mode on the camera. The OSD displays the message, "Auto Focus: ONE PUSH."

Custom tour

Click this button to view (in continuous playback) a custom tour that was previously configured.

3.1.7 Recording status



The hard drive icon below the live camera image changes during an automatic recording. The icon lights up and displays a moving graphic to indicate a running recording. If no recording is taking place, a static icon is displayed.

3.1.8 Saving snapshots

Individual images from the displayed live video stream can be saved locally in JPEG format on the computer's hard drive. The storage location depends on the configuration of the camera.



– Click the photo camera icon to save a single image.

3.1.9 Recording live video

Video sequences from the displayed live video stream can be saved locally on the computer's hard drive. The sequences are recorded at the resolution specified in the encoder configuration. The storage location depends on the configuration of the camera.



1. Click the recording icon to record video sequences.
 - Saving begins immediately. The red dot on the icon indicates that a recording is in progress.
2. Click the recording icon again to stop recording.

3.1.10 Full-screen display



Click the full-screen icon to view the selected stream in full-screen mode; press **Esc** on the keyboard to return to the normal viewing window.

3.1.11 Video Security App

Start Video Security app



To start the Video Security app, click .

3.1.12 Date and Time

Date/Time (unlabeled)



The unlabeled date and time ticker appears above the row of icons (including



) that is below the lower-left corner of the live video image.

3.1.13 Audio communication

Audio can be sent and received via the **Live** page if the unit and the computer support audio.

1. Press and hold the F12 key on the keyboard to send an audio signal to the unit.
2. Release the key to stop sending audio.

All connected users receive audio signals sent from the unit but only the user who first pressed the F12 key can send audio signals; others must wait for the first user to release the key.

3.1.14 Storage, CPU and network status

When accessing the unit with a browser, the local storage, processor and network status icons are shown in the upper right of the window.

When a local storage card is available, the memory card icon changes color (green, orange or red) to indicate the local storage activity. If you hover over this icon with the mouse the storage activity is shown as a percentage.

If you hover over the middle icon, the CPU load is shown.

If you hover over the right-hand icon, the network load is shown.

This information can help with problem solving or when fine tuning the unit. For example:

- if the storage activity is too high, change the recording profile,
- if the CPU load is too big, change the VCA settings,
- if the network load is too big, change the encoder profile to reduce bitrate.

3.1.15 Status icons

Various overlays in the video image provide important status information. The overlays provide the following information:



Decoding error

The frame might show artifacts due to decoding errors.



Alarm flag

Indicates that an alarm has occurred.



Communication error

A communication error, such as a connection failure to the storage medium, a protocol violation or a timeout, is indicated by this icon.



Gap

Indicates a gap in the recorded video.



Watermark valid

The watermark set on the media item is valid. The color of the check mark changes according to the video authentication method that has been selected.



Watermark invalid

Indicates that the watermark is not valid.



Motion alarm


Indicates that a motion alarm has occurred.



Storage discovery

Indicates that recorded video is being retrieved.

3.2 Playback via browser

Click  **Playback** in the application bar to view, search or export recordings. This link is only visible if a direct iSCSI or memory card has been configured for recording. (With VRM recording this option is not active.)

The panel on the left has four groups:

- **Connection**
- **Search**
- **Export**
- **Track list**

3.2.1 Selecting the recording stream

On the left side of the browser, expand the **Connection** group if necessary.

To view a recording stream:

1. Click the **Recording** drop-down arrow to see the options.
2. Select recording stream 1 or 2.

3.2.2 Searching for recorded video

On the left side of the browser, expand the **Search** group if necessary.

1. To limit the search to a particular time range, enter the date and times for the start and stop points.
2. Select an option from the drop-down box to define a search parameter.
3. Click **Start Search**.
4. The results are shown.
5. Click a result to play it back.
6. Click **Back** to define a new search.

3.2.3 Exporting recorded video

On the left side of the browser, expand the **Export** group if necessary.

1. Select a track in the track list or in the search results (or click on the timeline below the video window and drag the buttons to mark the sequence you want to export).
2. The start and stop date and time are filled-in for the selected track. If required, change the times.
3. In the **Time lapse** drop-down box, select the original or a condensed speed.
4. In the **Location** drop-down box, select a target.
5. Click **Export** to save the video track.

Note:

The target server address is set on the **Network / Accounts** page.

3.2.4 Controlling playback

The time bar below the video image allows quick orientation. The time interval associated with the sequence is displayed in the bar in gray. Arrows indicate the position of the image currently being played back within the sequence.

The time bar offers various options for navigation in and between sequences.

- If required, click in the bar at the point in time at which the playback should begin.
- Change the time interval displayed by clicking the plus or minus icons or use the mouse scroll wheel. The display can span a range from six months to one minute.
- Click the alarm jump buttons to go from one alarm event to the next or to the previous one. Red bars indicate the points in time where alarms were triggered.

Controls

Control playback by means of the buttons below the video image.

The buttons have the following functions:

- Start/Pause playback
- Select the playback (forward or backward) speed using the speed regulator
- Step forward or backward frame-by-frame when paused (small arrows)

4 General

4.1 Identification

Device name

Enter a unique, unambiguous name for the device (for example, the installation location of the device). This name should be easy to identify in a list of devices in your system. The device name is used for the remote identification of a unit, such as in the event of an alarm.

Do not use any special characters, for example **&**, in the name. Special characters are not supported by the system's internal management.

Device ID

Enter a unique identifier for the device. This ID is additional identification for the device.

Video 1

Enter a name or description for the Video 1 stream (for example, "Visible image").

Video 2

Enter a name or description for the Video 2 stream (for example, "Thermal image").

Initiator extension

Add text to an initiator name to make identification easier in large iSCSI systems. This text is added to the initiator name, separated from it by a full stop. (You can see the initiator name in the System Overview page.)

4.2 User Management

The section **Allowed authentication modes** provides information about the authentication modes set in the camera. A checkmark appears in the checkbox to the left of the mode if the mode is set. If the mode is not set, the phrase, "No certificate installed" appears to the right of the mode name.

Password

This field indicates if a password is set for the camera.

Certificate

A check mark in this check box indicates that at least one certificate is loaded onto the camera. If no certificates are loaded, then "No certificate installed" appears to the right of the text.

The Escrypt certificate is a root certificate for Bosch Security Systems that proves that the device meets the following criteria:

- It originates from a Bosch factory that is a secure environment.
- It has not been tampered with.

Escrypt is a Bosch company and Certificate Authority (CA).

Active directory server (ADFS)

A check mark in this check box indicates that the camera uses an active directory server. If the camera does not use ADFS, then "No certificate installed" appears to the right of the text.

Password management

A password prevents unauthorized access to the device. You can use different authorization levels to limit access.

Proper password protection is only guaranteed when all higher authorization levels are also protected with a password. Therefore, you must always start from the highest authorization level when assigning passwords.

You can define and change a password for each authorization level if you are logged into the "service" user account.

The device has three authorization levels: service, user, and live.

- service is the highest authorization level. Entering the correct password gives access to all the functions and allows all configuration settings to be changed.
- user is the middle authorization level. At this level you can operate the device, play back recordings, and also control camera, for example, but you cannot change the configuration.
- live is the lowest authorization level. At this level you can only view the live video image and switch between the different live image displays.

To edit a password

To edit a password, click the pencil icon to the right of the column **Type** for the appropriate **User name**.

To create a new user

To create a new user, click **Add**.

In the box **User**, fill in the fields. For Group, select the appropriate authorization level. For **Type**, select either **Password** (for a new password) or **Certificate** (for a certificate that the new user is authorized to use).

Note: Use a maximum of 19 characters. Do not use special characters.

Confirm password

In each case, enter the new password a second time to eliminate typing mistakes.



Notice!

A new password is only saved when you click the **Set** button. You should therefore click the **Set** button immediately after entering and confirming a password.

4.3

Date/Time

Date format

Select your required date format.

Device date/Device time



Notice!

Ensure that recording is stopped before syncing to the PC.

If there are multiple devices operating in your system or network, it is important to synchronize their internal clocks. For example, it is only possible to identify and correctly evaluate simultaneous recordings when all units are operating on the same time.

1. Enter the current date. Since the unit time is controlled by the internal clock, there is no need to enter the day of the week – it is added automatically.
2. Enter the current time or click the **Sync to PC** button to copy your computer's system time to the camera.

Note: It is important that the date/time is correct for recording. An incorrect date/time setting could prevent correct recording.

Device time zone

Select the time zone in which your system is located.

Daylight saving time

The internal clock can switch automatically between normal and daylight saving time (DST). The unit already contains the data for DST switch-overs for many years in advance. If the date, time and zone have been set up correctly, a DST table is automatically created.

If you decide to create alternative daylight saving time dates by editing the table, note that values occur in linked pairs (DST start and end dates).

First, check the time zone setting. If it is not correct, select the appropriate time zone and click **Set**.

1. Click **Details** to edit the DST table.
2. Select the region or the city which is closest to the system's location from the list box below the table.
3. Click **Generate** to fill the table with the preset values from the unit.
4. Click one of the entries in the table to make changes. The entry is highlighted.
5. Click **Delete** to remove the entry from the table.
6. Choose other values from the list boxes under the table, to change the selected entry. Changes are immediate.
7. If there are empty lines at the bottom of the table, for example after deletions, add new data by marking the row and selecting values from the list boxes.
8. When finished, click **OK** to save and activate the table.

Time server IP address

The camera can receive the time signal from a time server using various time server protocols, and then use it to set the internal clock. The unit polls the time signal automatically once every minute.

Enter the IP address of a time server here.

Time server type

Select the protocol that is supported by the selected time server. Preferably, you should select the **SNTP server** as the protocol. This supports a high level of accuracy and is required for special applications and subsequent function extensions.

Select **Time server** for a time server that works with the protocol RFC 868.

4.4 Display Stamping

Various overlays or “stamps” in the video image provide important supplementary information. These overlays can be enabled individually and are arranged on the image in a clear manner.

Camera name stamping

This field sets the position of the camera name overlay. It can be displayed at the **Top**, at the **Bottom** or at a position of your choice that you can then specify using the **Custom** option. Or it can be set to **Off** for no overlay information.

1. Select the desired option from the list.
2. If you select the **Custom** option, additional fields are displayed where you can specify the exact position (**Position (XY)**).
3. In the **Position (XY)** fields, enter the values for the desired position.

Logo

To place a logo on the image, select and upload an uncompressed .bmp file with a maximum size of 128x128 pixels and 256 colors to the camera. Its position on the image can then be selected.

Logo position

Select the position for the logo on the OSD: **To the left of the name**, **To the right of the name**, or **Logo only**.

Select **Off** (the default value) to disable logo positioning.

Time stamping

This field sets the position of the time overlay. It can be displayed at the **Top**, at the **Bottom** or at a position of your choice that you can then specify using the **Custom** option. Or it can be set to **Off** for no overlay information.

1. Select the desired option from the list.
2. If you select the **Custom** option, additional fields are displayed where you can specify the exact position (**Position (XY)**).
3. In the **Position (XY)** fields, enter the values for the desired position.

Display milliseconds

If necessary, you can also display milliseconds. This information can be useful for recorded video images; however, it does increase the processor's computing time. Select **Off** if you do not need to display milliseconds.

Live video indicator

Select **On** to display the **Live video indicator**, an icon that pulses on the OSD to show that the video stream is live.

Select **Off** to hide the **Live video indicator**.

Alarm mode stamping

Select **On** to display a text message overlay in the image in the event of an alarm. It can be displayed at a position of your choice that you can then specify using the **Custom** option. Or it can be set to **Off** for no overlay information.

1. Select the desired option from the list.
2. If you select the **Custom** option, additional fields are displayed where you can specify the exact position (**Position (XY)**).
3. In the **Position (XY)** fields, enter the values for the desired position.

Alarm message

Enter the message to be displayed in the image in the event of an alarm. The maximum text length is 31 characters.

Title OSD

OSD titles can be displayed at a position of your choice.

Select **On** to display sector or pre-position title overlays continuously in the image.

Select **Momentary** to display sector or pre-position title overlays for a few seconds.

1. Select the desired option from the list.
2. Specify the exact position (**Position (XY)**).
3. In the **Position (XY)** fields, enter the values for the desired position.

Select **Off** to deactivate the display of overlay information.

Camera OSD

Select **On** to momentarily display camera response information, such as Digital Zoom, Iris open/close, and Focus near/far overlays in the image. Select **Off** to display no information.

1. Select the desired option from the list.
2. Specify the exact position (**Position (XY)**).
3. In the **Position (XY)** fields, enter the values for the desired position.

Title region

Select **On** to set or to edit the position of the title region on the OSD.

The fields **Position (XY)** and **(0...255)** appear.

1. In the field **Position (XY)**, specify the exact position. (The default is 10.)
2. In the field **(0...255)**, enter the position range. (The default is 176).

Select **Off** to hide the region from view.

Telemetry region

Select **On** to set or to edit the position of the telemetry information (azimuth and elevation (pan/tilt position)) and the zoom factor on the OSD. Refer to the section "PTZ Settings, page 39" to set the pan and tilt limits.

The fields **Position (XY)** and **(0...255)** appear.

1. In the field **Position (XY)**, specify the exact position. (The default is 10.)
2. In the field **(0...255)**, enter the position range. (The default is 176).

Select **Off** to hide the region from view.

Feedback region

Select **On** to set or to edit the position of system feedback messages (including message for camera settings such as focus, iris, and zoom level) on the OSD. Refer to the section "Lens Settings" to configure these settings.

The fields **Position (XY)** and **(0...255)** appear.

1. In the field **Position (XY)**, specify the exact position. (The default is 10.)
2. In the field **(0...255)**, enter the position range. (The default is 176).

Select **Off** to hide the region from view.

Transparent background

Check this box to make transparent the stamp background on the image.

Stamping size

Select the desired font size of the overlays on the OSD: **Normal** or **Big**.

Video authentication

Select from the **Video authentication** drop-down box a method for verifying the integrity of the video.

If you select **Watermarking**, all images are marked with an icon. The icon indicates if the sequence (live or saved) has been manipulated.

If you want to add a digital signature to the transmitted video images to ensure their integrity, select one of the cryptographic algorithms for this signature.

Signature interval [s]

For certain **Video authentication** modes, enter the interval (in seconds) between insertions of the digital signature.

4.5

GB/T 28181

This page allows you to set the parameters for conformance to the GB/T 28181 national standard "Security and protection video monitoring network system for information transport, switch and control". This standard is specifically for China.

Enable

Select this checkbox to enable the system to use the other parameters on this page in accordance with the GB/T 28181 national standard.

H.264 elementary stream

Select this checkbox to select or to enable the H.264 elementary stream.

Registration timeout

Enter a value (in milliseconds) for the registration timeout. The default is 3600.

Heartbeat timeout

Enter the value (in seconds) for the heartbeat timeout. The default is 15.

Server ID

Enter the ID of the server.

Server IP address

Enter the server IP address.

Device ID

Enter the ID of the device.

Device port

Enter the number of the device port. The default is 5060.

Password

Enter the appropriate password.

Alarm device ID

Enter the ID of the alarm device.

5 Web Interface

5.1 Appearance

You can adapt the appearance of the web interface and change the website language to meet your requirements.

GIF or JPEG images can be used to replace the company and device logos. The image can be stored on a web server (for example, <http://www.myhostname.com/images/logo.gif>).

Ensure that a connection to the web server is always available to display the image. The image files are not stored on the unit.

To restore the original graphics, delete the entries in the **Company logo** and **Device logo** fields.

Website language

Select the language for the user interface.

The default language is English. After selecting a different language, click the **Set** button. The page refreshes automatically. The GUI now displays field names and options as well as OSD messages in the selected language.

Company logo

To replace the company's logo in the top-right part of the window, enter the path to a suitable image in this field. The image file must be stored on a web server.

Device logo

To replace the device name in the top-left part of the window, enter the path to a suitable image in this field. The image file must be stored on a web server.



Notice!

If you want to use the original image again, delete the entries in the fields **Company logo** and **Device logo**.

Show VCA metadata

When video content analysis (VCA) is activated, additional information is displayed in the live video stream. With the MOTION+ analysis type, for example, the sensor fields in which motion is recorded are marked with yellow rectangles.

Using Essential Video Analytics or Intelligent Video Analytics, the outlines of detected objects are displayed in following colors:

- Red: Objects that generate an alarm event under the current settings appear on the camera image inside a red outline.
- Orange: An object that has triggered one alarm event but does not generate another appears inside an orange outline (example: object has crossed a line). During forensic search, an object that triggers an alarm event has an orange outline from the beginning.
- Yellow: Objects that are detected as moving but do not generate an alarm event under the current settings appear inside a yellow outline.

If the metadata fusion feature is enabled (that is, VCA is enabled for both the visible and thermal image streams), events generated by both visible and thermal image streams will appear on both the visible and thermal images.

The following table identifies the metadata that appear.

Image being viewed	Imager that Detected Object	Resulting outlines
Visible	Visible imager	Solid box
	Thermal imager	Dotted box

Image being viewed	Imager that Detected Object	Resulting outlines
Thermal	Visible imager	Dotted box
	Thermal imager	Solid box

Show VCA trajectories

The trajectories (motion lines of objects) from the video content analysis are displayed in the live video image if a corresponding analysis type is activated. The trajectory is shown as a green line following the object base point.

If the metadata fusion feature is enabled (that is, VCA is enabled for both the visible and thermal image streams), trajectory lines will appear on both the visible and thermal image streams.

The following table identifies the trajectory lines that appear.

Image being viewed	Imager that Detected Object	Resulting trajectory lines
Visible	Visible imager	Solid green line
	Thermal imager	Dotted green line
Thermal	Visible imager	Dotted green line
	Thermal imager	Solid green line

Note: For details about how VCA objects appear on the **Live** page, refer to the section *Understanding the Fusion Feature, page 77*.

Show overlay icons

Select this check box to show overlay icons on the live video image.

Show VCA items

Shows alarm fields, lines and routes configured for the video analytics in the following colors:

- Green: Fields, lines and routes used in a task are displayed in green. They can be edited but not deleted.
- Red: Fields, lines and routes currently in alarm mode are displayed in red.

Latency mode

Select the required latency mode:

- **Low delay:** Default mode. Provides marginal buffering to display fluent video under normal network conditions.
- **Smooth video:** Allows the buffer to automatically adjust to cover network jitter, inducing higher latency.
- **Unbuffered:** Displays video as it is received by the decoder with minimum latency. Allows the video to jerk if there is network jitter.

JPEG resolution

You can specify the size of the JPEG image on the **Live** page. Options are **Small**, **Medium**, **Large**, 720p, 1080p, and **“Best possible”** (default).

JPEG interval

You can specify the interval at which the individual images should be generated for the M-JPEG image on the **Live** page.

JPEG quality

You can specify the quality at which the JPEG images appear on the **Live** page.

5.2 LIVE Functions

On this page you can adapt the functions on the **LIVE** page to your requirements. You can choose from a variety of different options for displaying information and controls.

1. Check the box for the items that are to be made available on the **LIVE** page. The selected items are indicated by a check mark.
2. Check whether the required functions are available on the **LIVE** page.

Transmit audio

You can only select this option if audio transmission is actually switched on (see Audio). The audio signals are sent in a separate data stream parallel to the video data, and so increase the network load. The audio data are encoded according to G.711 and require an additional bandwidth of approx. 80 kbps per connection in each direction.

Lease time (s)

The lease time in seconds determines the time beyond which a different user is authorized to control the camera after no further control signals are received from the current user. After this time interval, the camera is automatically enabled for another user.

Allow snapshots

Here you can specify whether the icon for saving individual images (snapshots) should be displayed below the live image. Individual images can only be saved if this icon is visible.

Allow local recording

Here you can specify whether the icon for saving (recording) video sequences on the local memory should be displayed below the live image. Video sequences can only be saved if this icon is visible.

I-frames only stream

Here you can specify whether the **LIVE** page displays a viewing tab for an I-frame only stream.

Show 'Pre-positions'

Here you can specify whether the section **Pre-positions** of the **Live** page displays a drop-down box with the list of scenes set in the section **Camera > Pre-positions and Tours** of the **Configuration** page.

Show 'AUX Control'

Here you can specify whether the **Live** page displays the section **Show 'AUX Control'**.

Show 'Intelligent Tracking'

Here you can specify whether the **LIVE** page displays the controls for the Intelligent Tracking feature.

Show 'Special Functions'

Here you can specify whether the **Live** page displays the section **Special Functions**.

Path for JPEG and video files

1. Enter the path for the storage location of individual images and video sequences that you can save from the **LIVE** page.
2. If necessary, click **Browse** to find a suitable directory.

Video file format

Select a file format for the live page display. The MP4 format does not include metadata.

6 Camera

6.1 Installer Menu

Application variant

- If you are connecting to MIC-ALM-WAS-24, select “[camera name] - IO“ to allow the camera to recognize additional inputs and outputs from this device and to allow control of an external washer unit.
- If you are connecting to VJC-7000-90, select “[camera name] – VJC-7000“ to allow the camera to recognize additional inputs and outputs from this device and to allow control of an external washer unit.
- Otherwise, select “[camera name].”

Base frame rate

Select the base frame rate for the camera.

Note: Shutter times, frame rates, and the analog output (if present) are affected by this value.



Notice!

Changing the field **Base frame rate**

A change to the parameter in the field **Base frame rate** requires approximately 10-20 seconds to complete. During this time, no changes can be made. The camera image freezes.

Coding standard

Select the encoding mode, H.264 or H.265 .

Merge meta data

Select this checkbox to merge the meta data from the two video streams.

Orientation

Reverses the image 180° (ideal when mounting upside down). Set the orientation to Normal (default) or Inverted.



Caution!

The camera disables the Privacy Mask function if the orientation is set to Inverted.

SC settings

Click the Default button to restore all camera settings to their original defaults.

Reboot device

Click the Reboot button to reboot the camera. There is a ten (10) second pause before the camera starts its homing phase. During the homing phase, the camera will complete finding the upper and lower tilt limits.

Factory defaults

Click **Defaults** to restore the factory defaults for the camera. A confirmation screen appears. Allow several seconds for the camera to optimize the picture after a reset.

Note: Clicking this button also clears the service-level password. Operators must reset the password before doing anything else.

6.1.1

Positioning

The **Positioning** feature describes the location of the camera and the perspective in the camera’s field of view.

Perspective information is essential to Video Analytics, as it enables the system to compensate for the illusory smallness of distant objects.

Only through use of perspective information is it possible to distinguish objects such as persons, bicycles, cars and trucks, and accurately compute their real size and speeds as they move through 3D space.

However, to calculate perspective information accurately, the camera must be directed at a single, flat horizontal plane. Multiple and inclined planes, hills, stairs can falsify perspective information and produce incorrect object information such as size and speed.

Mounting position

The mounting position describes the perspective information that is also often called calibration.

This parameter is important for Intelligent Tracking. If using Intelligent Tracking, select **Standard**.

The MIC camera provides the tilt angle and the focal length automatically to complete the global calibration for every potential field of view of the camera.

Height [m]

The height describes the vertical distance from the camera to the ground plane of the captured image. Typically the elevation of the mounted camera above the ground.

Enter the height in meters of the position of the camera.

Sketch

The **Sketch** functionality offers an additional, half-automatic calibration method. This calibration method allows you to describe the perspective in the camera's field of view by drawing vertical lines, ground lines, and ground angles in the camera image and entering the correct size and angle. Use the **Sketch** functionality if the result of the automatic calibration is not sufficient.

You can also combine this manual calibration with the values for roll angle, tilt angle, height and focal length calculated by the camera or entered manually.

Click to improve the automatic calibration. The **Sketch Calibration** window is displayed.

VCA Profile

Select the appropriate profile.

Global

Select the **Global** check box to use the global, overall calibration for all AUTODOME and MIC cameras.

Alternatively, clear the **Global** check box to obtain a local calibration and overwrite the global calibration for the selected profile. To do this, select the VCA profile before.

Notice!

The **Sketch** functionality is only available for configured and assigned pre-positions.

For AUTODOME and MIC cameras, configure the pre-positions of the camera and assign the pre-positions to one of the available 16 VCA profiles before calibration with **Sketch**.

Applications are pre-positions of cameras directed towards different ground planes, an optimized calibration for inclined ground planes or large focal lengths. A local pre-position calibration does not change the global calibration.

It is also possible to calibrate pre-positions without entering a global calibration.



Calculate

Select the **Calculate** check box to obtain the roll angle, tilt angle, height and focal length from the sketched calibration elements - vertical lines, ground lines and angles - you have placed in the camera.

Clear the **Calculate** check box to enter a value manually or to refresh to the values provided by the camera itself.

Tilt angle [°] / Roll angle [°]

Enter the angle manually, or click the refresh icon to obtain values provided by any sensors that the camera may have. Alternatively, select the **Calculate** check box to obtain values based on the calibration elements marked on the image.

Height [m]

Enter the height manually, or click the refresh icon to obtain values provided by any sensors that the camera may have. Alternatively, select the **Calculate** check box to obtain values based on the calibration elements marked on the image.


Focal length


Enter the focal length manually, or click the refresh icon to obtain values provided by any sensors that the camera may have. Alternatively, select the **Calculate** check box to obtain values based on the calibration elements marked on the image.


Calibrating cameras using the Sketch Calibration window

To determine non-automatically set values:

1. Enter the value for tilt angle, roll angle, height and focal length if the value is known, for example, by measuring the height of the camera above the ground, or reading the focal length from the lens.
2. For each value that is still unknown, select the **Calculate** check box, then place a calibration element on the camera image. Use these calibration elements to trace individual outlines of the displayed environment in the camera image and define the position and size of these lines and angles.

- Click  to place a vertical line across the image. A vertical line corresponds to a line that is perpendicular to the ground plane, such as a door frame, edge of a building or a lamp post.

- Click  to place a line across the ground in the image. A line on ground corresponds to a line that is on the ground plane, such as a road marking.

- Click  to place an angle on the ground in the image. The angle on ground represents an angle lying on the horizontal ground plane, such as the corner of a carpet or parking bay markings.

3. Adjust the calibration elements to the situation:
 - Enter the real size of a line or angle. To do this, select the line or angle, then enter the size in the corresponding box.

Example: You have placed a line on ground across the lower side of an automobile. You know that the automobile is 4 m long. Enter 4 m as the length of the line.
 - Adjust the position or length of a line or angle. To do this, drag the line or angle or move the end points to the desired position in the camera image.
 - Remove a line or angle. To do this, select the line or angle, then click the trash can icon.

Note:

Blue lines indicate calibration elements added by you.

White lines represent the element as it should be positioned on the camera image based on the current calibration results or the determined calibration data.

Horizon

If the values correspond, areas on the camera image have a colored background.

blue: This area corresponds to the sky. The bottom line of the blue area represents the horizon. Objects that are detected in the blue area cannot be filtered correctly by size or speed.

If the camera is installed at a relatively low height in a building, for example, this display is not required, because the entire area covered by the camera is below the horizon.

**Notice!**

If the distance to the camera (geolocation) is not relevant, it is enough to determine height and focal length in relation to each other. This allows a simple calibration by marking 2-3 persons - each with a vertical line - and setting their size. 1,80 m (71 in.) for all is sufficient. Use at least one person in the front and one person in the background of the image for best results.

Coordinate system

The **Coordinate system** feature describes the position of the camera in a local **Cartesian** or the global **WGS 84** coordinate system. The camera and the objects tracked by the video analytics are displayed on a map.

Select the coordinate system and enter the appropriate values in the additional input fields that appear depending on the coordinate system selected.

Cartesian

The Cartesian coordinate system describes each point in the space by a combination of the position on three orthogonal axes X, Y and Z. A right-handed coordinate system is used, where X and Y span the ground plane and Z describes the elevation of the ground plane.

X [m]

The location of the camera on the ground on the X-axis.

Y [m]

The location of the camera on the ground on the Y-axis.

Z [m]

The elevation of the ground plane. To determine the elevation of the camera, add the **Z [m]** value and the **Height [m]** value of the camera.

WGS 84

The WGS 84 coordinate system is a spherical coordinate system description of the world and used in many standards including GPS.

Latitude

Latitude is the north-south position of the camera in the spherical coordinate system WGS 84.

Longitude

Longitude is the east-west position of the camera in the spherical coordinate system WGS 84.

Ground level [m]

The elevation of the ground above sea level. To determine the elevation of the camera, add the **Ground level [m]** value and the **Height [m]** value of the camera.

Azimuth [°]

The orientation of the camera in a counter-clockwise angle starting with 0° in the east (WGS 84) or on the X-axis (Cartesian). If the camera is directed towards the north (WGS 84) or the Y-axis (Cartesian), the azimuth is 90°.

6.2

Encoder Profile

For the video signal encoding, you can select a code algorithm and you can change the presets for the profiles.

You can adapt the video data transmission to the operating environment (for example network structure, bandwidth, data load). To this end, the camera simultaneously generates two data streams (Dual Streaming), which compression settings you can select individually, for example one setting for transmissions to the Internet and one for LAN connections.

Pre-programmed profiles are available, each giving priority to different perspectives.

You can change individual parameter values of a profile and you can also change the name.

You can switch between profiles by clicking the appropriate tabs.



Caution!

The profiles are rather complex. They include a large number of parameters that interact with one another, so it is generally best to use the default profiles.

Change the profiles only once you are fully familiar with all the configuration options.

Note: In the default setting, Stream 1 is transmitted for alarm connections and automatic connections.



Notice!

All parameters combine to make up a profile and are dependent on one another. If you enter a setting that is outside the permitted range for a particular parameter, the nearest permitted value will be substituted when the settings are saved.

Profile name

Profile number	Default Profile name	Description
Profile 1	HD Image Optimized	For an HD image, the video bit rate and frame quality are adjusted to ensure that the picture quality is the priority.
Profile 2	HD Balanced	For an HD image, the video bit rate and frame quality are adjusted to a median profile for everyday use.
Profile 3	HD Bit Rate Optimized	For an HD image, the video bit rate and frame quality are adjusted to ensure that the bit rate is the priority.
Profile 4	SD Image Optimized	For an SD image, the video bit rate and frame quality are adjusted to ensure that the picture quality is the priority.
Profile 5	SD Balanced	For an SD image, the video bit rate and frame quality are adjusted to a median profile for everyday use.
Profile 6	SD Bit Rate Optimized	For an SD image, the video bit rate and frame quality are adjusted to ensure that the bit rate is the priority.
Profile 7	DSL Optimized	Ideal for encoding on a DSL uplink where bit rate limitations are critical.
Profile 8	3G Optimized	Ideal for encoding on a 3G uplink where bit rate limitations are critical.

If required, enter a new name for the profile.

Bit rate optimization

Select the appropriate rate for bit rate optimization.

Options are Off, Maximum quality, High quality, Medium (default), Low bit rate, Minimum bit rate.

Maximum bit rate

This maximum bit rate is not exceeded under any circumstances. Depending on the video quality settings for the I- and P-frames, this fact can result in individual images being skipped. The value entered here must be at least 10% higher than the value entered in the **Target bit rate** field. If the value entered here is too low, it will be adjusted automatically.

Averaging period

Select the appropriate averaging period as a means of stabilizing the long term bit rate.

Target bit rate

To optimize use of the bandwidth in the network, limit the data rate for the device. The target data rate should be set according to the desired picture quality for typical scenes with no excessive motion.

For complex images or frequent changes of image content due to frequent movements, this limit can temporarily be exceeded up to the value entered in the **Maximum bit rate** field.

Note: You can change the value in this field only if you select a duration in the field **Averaging period**. If you do not select an **Averaging period**, then the field **Target bit rate** is greyed out.

Encoding interval

The **Encoding interval** slider determines the interval at which images are encoded and transmitted. This can be particularly advantageous with low bandwidths. The image rate is displayed next to the slider.

Video resolution

Select the desired resolution for the video image.

Note: The value in this field adjusts the resolution for SD streams only.

Expert settings

If necessary, use the expert settings to adapt the I-frame quality and the P-frame quality to specific requirements. The setting is based on the H.264 quantization parameter (QP).

GOP structure

Select the structure that you require for the group of pictures, depending on whether you place greater priority on having the lowest possible delay (IP frames only) or using as little bandwidth as possible.

Options are IP, IBP, and IBBP.

I-frame distance

This parameter allows you to set the intervals in which the I-frames will be coded. Auto means auto mode, whereby the video server inserts I-frames as necessary. Values range from 3 to 60. An entry of 3 indicates that I-frames are continuously generated. An entry of 4 indicates that only every fourth image is an I-frame, and so on; the frames in between are coded as P-frames. Note that the values supported depend on the GOP structure setting. For example, only even values are supported with IBP; if you have selected IBBP, only 3 or multiples of 3 are supported.

Min. P-frame QP

This parameter allows you to adjust the image quality of the P-frame and to define the lower limit for the quantization of the P-frames, and thus the maximum achievable quality of the P-frames. In the H.264-protocol, the Quantization Parameter (QP) specifies the degree of compression and thus the image quality for every frame. The lower the quantization of the P-

frame (QP value), the higher the encoding quality (and thus the best image quality) and the lower the frame refresh rate depending on the settings for the maximum data rate under network settings. A higher quantization value results in low image quality and lower network load. Typical QP values are between 18 and 30.

The basic setting Auto automatically adjusts the quality to the settings for the P-frame video quality.

I/P-frame delta QP

This parameter sets the ratio of the I-frame quantization (QP) to the P-frame quantization (QP). For example, you can set a lower value for I-frames by moving the slide control to a negative value. Thus, the quality of the I-frames relative to the P-frames is improved. The total data load will increase, but only by the portion of I-frames. The basic setting Auto automatically adjusts to the optimum combination of movement and image definition (focus). To obtain the highest quality at the lowest bandwidth, even in the case of increased movement in the picture, configure the quality settings as follows:

1. Observe the coverage area during normal movement in the preview images.
2. Set the value for **Min. P-frame QP** to the highest value at which the image quality still meets your needs.
3. Set the value for **I/P-frame delta QP** to the lowest possible value. This is how to save bandwidth and memory in normal scenes. The image quality is retained even in the case of increased movement since the bandwidth is then filled up to the value that is entered under **Maximum bit rate**.

Background delta QP

Select the appropriate encoding quality level for a background region defined in Encoder Regions. The lower the QP value, the higher the encoding quality.

Object delta QP

Select the appropriate encoding quality level for an object region defined in Encoder Regions. The lower the QP value, the higher the encoding quality.

Default

Click **Default** to return the profile to the factory default values.

6.3

Encoder Streams

Note: If you access this menu while the camera is recording, the following message appears at the top of the page:

Recording is currently active. Therefore, for 'Current profile' the respective stream profile selected for recording is displayed for information.

When you access the **Encoder Streams** menu, the left tab (**Video 1**) is selected. The **Video 1** tab displays the **Encoder Streams** options for the visible camera.

To configure **Encoder Streams** options for the thermal camera, select the right tab (**Video 2 / Camera 2**).

Property

Select one of the resolutions for each stream.

Note: In order to select the option "720p50/60" here, you must first set the field **Base frame rate** in **Camera > Installer Menu** to "60 fps."

The table below identifies the options available in the field **Property** for Stream 1 and the available options in the field **Property** for Stream 2, depending on the options selected for Stream 1.

	Options
Stream 1 (recording)	720p
	1080p

Option selected for Stream 1 (recording)	Options for Stream 2 (recording)
720p	SD
	720p
	D1 4:3 (cropped)
	640x480

1080p	SD
	720p
	1080p*
	D1 4:3 (cropped)
	640x480
	1280x1024 (cropped)

* **Note:** This option is valid only if the option selected in the field **Base frame rate** in **Camera > Installer Menu** is "30 fps." When the option for **Stream 1** is "1080p" and if the option selected in the field **Base frame rate** in **Camera > Installer Menu** is 60 fps, the option for **Stream 2** cannot be "1080p".

Non-recording profile

Select one of the following profiles for each stream:

Profile number	Default Profile name	Description
Profile 1	HD Image Optimized	For an HD image, the video bit rate and frame quality are adjusted to ensure that the picture quality is the priority.
Profile 2	HD Balanced	For an HD image, the video bit rate and frame quality are adjusted to a median profile for everyday use.
Profile 3	HD Bit Rate Optimized	For an HD image, the video bit rate and frame quality are adjusted to ensure that the bit rate is the priority.
Profile 4	SD Image Optimized	For an SD image, the video bit rate and frame quality are adjusted to ensure that the picture quality is the priority.
Profile 5	SD Balanced	For an SD image, the video bit rate and frame quality are adjusted to a median profile for everyday use.

Profile number	Default Profile name	Description
Profile 6	SD Bit Rate Optimized	For an SD image, the video bit rate and frame quality are adjusted to ensure that the bit rate is the priority.
Profile 7	DSL Optimized	Ideal for encoding on a DSL uplink where bit rate limitations are critical.
Profile 8	3G Optimized	Ideal for encoding on a 3G uplink where bit rate limitations are critical.

Note: Non-recording profiles (streams) are I-frame only.

JPEG stream

Select the resolution, frame rate, and image quality parameters for the **M-JPEG** stream.

- **Property:** Select the appropriate resolution.
- **Max. frame rate:** Select one of the following frame rates to be the maximum: 1, 3, 5, 6, 7.5, 10, 15, 25, 30, or 60 fps.
- **Picture quality:** This setting allows you to adjust the quality of the **M-JPEG** image. Use the slide bar to choose a quality between **Low** and **High**.

Note: The **M-JPEG** frame rate can vary depending on system loading.

6.4

Privacy Masks

Note: The sequence of fields in the GUI may not match the sequence of the fields in this section of the User Manual. In this section of the User Manual, fields appear in a more logical functional sequence, identifying the sequence to create a new privacy mask, and then to update a privacy mask.

Privacy Masks block specific areas of a scene from being seen in the camera's field of view. This can be useful when public spaces are in the coverage area or monitoring will be limited to a particular zone.

The areas covered are indicated by a colored pattern (**Black**, **White**, or **Gray**) in the video image. The activated masked areas are filled with the selected pattern in live view.

You can define a total of thirty-two (32) privacy masks in the camera.

A total of eight (8) masks can be in view at the same time.

Privacy mask

Select the number of the **Privacy mask**. A colored rectangle appears in the unlabeled video preview window above the **Set** button.

Use the mouse to define the area for each privacy mask.

Privacy Masks can have 3, 4, or 5 corners (which are blue in the preview window) and can form any convex shape.

The default mask template has four corners. You can add or delete corners as needed:

- To add a corner, double-click the side of the mask where you want to add the corner.
- To delete a corner, double-click the corner to remove.
- To amend the shape of a zone, place the cursor over the edge of the zone, hold down the mouse button and drag the edge of the zone to the required position.
- To reposition a zone, place the cursor over the zone, hold down the mouse button and drag into position.



Notice!

Draw the mask at 50% optical zoom or less for improved masking performance.

Draw the mask 10% larger than the object to ensure that the mask completely covers the object as the camera zooms in and out.

Pattern

Select the color of the mask as it will appear in live video: **Black**, **White**, or **Gray**.

If you select the **Pattern "Auto,"** the camera adjusts to the brightness or darkness of the background scene of the video. In other words, the color of the **Privacy mask** is the most prevalent of the three (**Black**, **White**, or **Gray**) in the background scene that the **Privacy mask** covers.

Mask enlargement

Select this check box to enlarge all masks automatically while the camera is in motion.

Zoom threshold

Click this check box to select the current zoom position at which the mask will appear as the camera zooms in or be hidden as the camera zooms out.

Enabled

Select this check box to draw the mask for the corresponding **Privacy mask** zone.

Clear this check box to erase the mask for an individual **Privacy mask** zone.

- To hide all privacy masks, click the check box **Disable masks**.

Note: You can disable masks individually by deselecting the check box **Disable masks**.

6.5

Picture Settings

Current mode

Select one of the pre-programmed user modes, optimized with the best settings for a variety of typical applications, that best defines the environment in which the camera is installed.

- **General:** Default mode. Suitable for most applications.
- **Motion:** Optimized to minimize motion artifacts, such as when monitoring traffic or fast-moving objects.
- **Low light:** Optimized performance for scenes with low light level.
- **Indoor:** Optimized for scenes with indoor lighting, and avoids the limitations imposed by the sun or street lighting.
- **Vibrant:** Provides enhanced contrast, color reproduction, and sharpness.

Customize the mode, if necessary, for the specific requirements of the site by selecting different values for the fields below.

In this case, the name of the user mode changes to "Custom."

White Balance

Adjusts the color settings to maintain the quality of the white areas of the image.

- **ATW:** allows the camera to continuously adjust color reproduction.
- **AWB Hold:** places the ATW on hold and saves the color settings.
- **Extended ATW** (default): allows the camera to constantly adjust for optimal color reproduction.
- **Manual:** Red and Blue gain can be manually set to a desired position.
- **Sodium Lamp Auto:** Automatically adjusts for sodium vapor light to restore objects to their original color.
- **Sodium Lamp:** Optimizes the sodium vapor light to restore objects to their original color.

Red Gain

The red gain adjustment offsets the factory white point alignment (reducing red introduces more cyan).

Blue Gain

The blue gain adjustment offsets the factory white point alignment (reducing blue introduces more yellow). It is only necessary to change the white point offset for special scene conditions.

Sodium red level

Adjust the level of red for sodium vapor lighting with the slider from 0 to 255.

Sodium blue level

Adjust the level of blue for sodium vapor lighting with the slider from 0 to 255.

Note: The fields **Sodium red level** and **Sodium blue level** appear only when the value in the field **White balance** is “Sodium lamp auto” or “Sodium lamp.”

Saturation

The percentage of light or color in the video image. Values range from 60% to 200%; the default is 110%.

Color hue

The degree of color in the video image (HD only). Values range from -14° to 14°; the default is 8°.

Intelligent Dynamic Noise Reduction

Select **On** to activate intelligent Dynamic Noise Reduction (DNR) which reduces noise based on motion and light levels.

Gain control

Adjusts the automatic gain control (AGC).

- **AGC** (default): Automatically adjusts the gain to the lowest possible value needed to maintain a good picture.
- **Fixed**: no enhancement. This setting disables the Max. Gain Level option.

Fixed Gain

Use the slide to select the desired number for fixed gain. The default is 2.

Maximum Gain Level

Controls the maximum value the gain can have during AGC operation. To set the maximum gain level, choose from:

- **Normal**
- **Medium**
- **High** (default)

AE-response speed

Select the speed of the response of auto exposure. Options are Super slow, Slow, Medium (default), Fast.

Sharpness mode

Select the appropriate sharpness mode. Options are **Manual** and **Auto**.

Sharpness level

This field is active when **Sharpness mode** is set to **Manual**.

Adjust the level of sharpness of the video image (from 1 to 15) using the slider.

Adjustments to the **Sharpness level** appear on the OSD.

Shutter Mode

- **Fixed**: The shutter mode is fixed to a selectable shutter speed.
- **Automatic exposure**: increases camera sensitivity by increasing the integration time on the camera. This is accomplished by integrating the signal from a number of consecutive video frames to reduce signal noise.

If you select this option, the camera disables **Shutter** automatically.

Shutter

Adjusts the electronic shutter speed (AES). Controls the time period for which light is gathered by the collecting device. The default setting is 1/60 second for NTSC and 1/50 for PAL cameras. The range of settings is from 1/1 to 1/10000.

Maximum automatic exposure

This limits the integration time when Frame Integration is active. The default is 1/4. The range of settings is from 1/4 to 1/30.

Top shutter speed

The camera tries to hold this shutter value as long as sufficient ambient light is available in the scene.

Settings range from 1/60 to 1/10000. The default value is 1/10000 for all modes except 'Motion' (default 1/500).

Backlight compensation

Optimizes the video level for the selected area of the image. Parts outside this area may be underexposed or overexposed. Select On to optimize the video level for the central area of the image. The default setting is Off.

High sensitivity

Adjusts the level of intensity or lux within the image. Select from **Off** or **On**.

Stabilization

Stabilization reduces camera shake in both the vertical and horizontal axis. The camera compensates for the movement of the image by up to 2% of the image size. This feature is ideal for cameras mounted on a pole or mast, or on another location that shakes frequently.

- **On** - Stabilization is always on.
- **Off** - Stabilization is disabled.
- **Auto** - Stabilization activates automatically when the camera detects vibration greater than the set threshold.

High dynamic range

Select On to activate wide dynamic range, which improves image reproduction in extreme high-contrast scenes.

Select Off to deactivate the feature.

Night mode

Selects night mode (B/W) to enhance lighting in low light scenes. Select from the following options:

- **Monochrome**: Forces the camera to stay in Night Mode and transmit monochrome images.
- **Color**: The camera does not switch to Night Mode regardless of ambient light conditions.
- **Auto** (default): The camera switches out of Night Mode after the ambient light level reaches a pre-defined threshold.

Night mode threshold

Adjusts the level of light at which the camera automatically switches out of night mode (B/W) operation. Select a value between 10 and 55 (in increments of 5; default 30). The lower the value, the earlier the camera will switch to color mode.

Night mode priority

Select the option to which the camera should give priority while in night mode:

- Motion
- Color (default)

Night mode shutter

Controls the time period for which light is gathered by the collecting device while in night mode. Values are $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{15}$, and $\frac{1}{30}$; the default is $\frac{1}{15}$.

Noise Reduction

Turns on the 2D and 3D noise reduction feature.

Noise Reduction Level

Adjusts the noise level to the appropriate level for shooting conditions. Select a value between 1 and 5.

2D noise reduction level

This field operates in conjunction with the field **Noise reduction**. When **Noise reduction** is set to "On," then the **Noise reduction level** field is active.

Select the appropriate level of noise reduction, from 1 to 5 (2 is the default).

3D noise reduction level

This field operates in conjunction with the field **Noise reduction**. When **Noise reduction** is set to "On," then the **Noise reduction level** field is active.

Select the appropriate level of noise reduction, from 1 to 5 (2 is the default).

Intelligent Defog

With the Defog mode feature, visibility can be improved significantly when viewing foggy or other low-contrast scenes.

- **On** - Defog is always active.
- **Off** - Defog is disabled.
- **Auto** - Defog activates automatically as needed.

Defog intensity

Select the amount of intensity for the defog feature.

Note: This field appears only when the option in Intelligent Defog is "On" or "Auto."

6.6

Picture Settings Thermal

Contrast enhancement

By default, this option is **On**, which allows users to adjust the amount of contrast and sharpness enhancement (in the **Contrast enhancement level** field).

Select **Off** to deactivate contrast enhancement. The camera will provide less contrast and no sharpness enhancement.

Contrast enhancement level

Slide the bar to change the **Contrast enhancement** or enter a value from 0 to 7.

Note the following points:

- The higher the Contrast enhancement level, the greater the contrast and sharpness enhancement.
- High Contrast enhancement levels will increase contrast as well as enhance random video noise. Depending on the encoder settings, a higher bit rate or lower compressed image quality may result.
- If the Contrast enhancement level is too high, areas of similar colors in the scene may appear to blend. Dark areas of the image might blend together, and light areas of the image might blend together.
- If the Contrast enhancement level is too low, it may be difficult to distinguish between objects that have similar temperatures.

Image gain level

Select the level of image gain, which controls the gain/magnification applied to the thermal video. Values range from 0 to 255; the default is 128.

Note: Raising the Image gain level for a given scene with objects of two different temperatures will increase the gray scale or color difference between the two objects in the scene.

Image brightness level

Select the level of image brightness, which controls the brightness of the thermal video scene by adding a DC offset to the video signal. Values range from 0 to 255; the default is 128.

If the scene is too dark in **White hot** mode or too bright in **Black hot** mode, increase the Image brightness level. White hot images become brighter; black hot images become darker.

If the image is too bright (white hot) or too dark (black hot), decrease the Image brightness level.

Noise reduction

By default, this option is **On**.

Noise reduction On enables temporal noise reduction, which reduces random video noise in the picture by averaging pixels across time if the difference between them is below a threshold. Off disables temporal noise reduction.

Thermal mode

Select the color mode that produces the best image based on the scene from the thermal imager:

Color Mode	Description
White hot	(Default setting) Hot objects will appear brighter than cold objects.
Black hot	Cold objects will appear brighter than hot objects.
Red Light	Cooler parts of a scene will show red. Hot objects will appear yellow.
Arcus	Objects of different temperatures will appear as shades of purple, green and red.
Inferno	Cooler parts of a scene will show red. Hot objects will appear yellow and white.
SoftLight	This mode is similar to Inferno mode, but with an overall softer image.
Sunset	Cooler parts of a scene will show purple. Hot objects will appear yellow and white.
Memoriam	Cooler parts of a scene will show yellow. Hot objects will appear black and white.
Flamma Arcticus	Cooler parts of a scene will show flat white. Hot objects will appear red and black.
Ocean	Cooler parts of a scene will show blue. Hot objects will appear black and white.
Rain	The scene will show a mixture of very grainy colors depending on temperature.
Rainbow	The scene will show objects in a rainbow of colors depending on temperature.

Polarity

Select **Normal** or **Inverted** to invert the colors.

Polarity of **Normal** causes hot temperatures and cold temperature to act as described in **Thermal mode**.

Polarity of **Inverted** inverts the operation of the thermal mode. The color/gray scale normally for hot objects applies instead to cold objects. The color/gray scale normally for cold objects applies instead to hot objects.

6.7

Lens Settings

Autofocus

Continuously adjusts the lens automatically to the correct focus for the sharpest picture.

- **One Push** (default; commonly called “Spot Focus”): activates the Auto Focus feature after the camera stops moving. Once focused, Auto Focus is inactive until the camera is moved again.
- **Auto Focus**: Auto Focus is always active.
- **Manual**: Auto Focus is inactive.

Focus speed

Use the slider (from 1 to 8) to control how fast the Auto focus will readjust when the focus becomes blurred.

IR focus correction

Optimizes the focus for IR lighting. Options are: On, Off (default).

Day near limit [m]

Select the distance (in meters), from 0.1 to 20 m, for the minimum distance of the zoom focus during the day.

Night near limit [m]

Select the distance (in meters), from 0.1 to 20 m, for the minimum distance of the zoom focus during the night.

Auto iris

Automatically adjusts the lens to allow the correct illumination of the camera sensor. This type of lens is recommended for use where there are low light or changing light conditions.

- **Constant** (default): camera constantly adjusts to varying light conditions (default).
If you select this option, the camera makes the following changes automatically:
 - **Gain Control**: switches to AGC.
 - **Shutter Speed**: switches to default.
- **Manual**: camera must be manually adjusted to compensate for varying light conditions.

Auto iris level

Increases or decreases brightness according to the amount of light. Type a value between 1 and 15.

Maximum zoom speed

Controls the zoom speed.

Zoom limit

Select the appropriate limit for zooming the camera: 20x, 30x.

Digital zoom

Digital zoom is a method of decreasing (narrowing) the apparent angle of view of a digital video image. It is accomplished electronically, without any adjustment of the camera's optics, and no optical resolution is gained in the process.

Select **Standard** (default) to enable this feature in standard mode.

Select **Enhanced** to enable this feature in enhanced mode.

Select **Off** to disable this feature.

6.8 PTZ Settings

Auto pan speed

Continuously pans the camera at a speed between right and left limit settings. Type a value between 1 and 60 (expressed in degrees), inclusive. The default setting is 30.

Inactivity

Selects the time period the dome must be not controlled until the inactivity event will be executed.

- **Off** (default): camera remains on a current scene indefinitely.
- **Pre-position 1**: camera returns to **Pre-position 1**.
- **Previous AUX**: camera returns to the previous AUX activity.

Inactivity period

Determines the behavior of the dome when the control for dome is inactive. Select a time period from the pull-down list (3 sec. - 10 min.). The default setting is 2 minutes.

Number of sectors

Select the appropriate number of sectors (for example, 4, 8, 12, or 16).

Note: The number that you select in this field determines the number of sectors that appear in the **Sectors** page (below).

Auto pivot

The Auto pivot tilts the camera through the vertical position as the camera is rotated to maintain the correct orientation of the image. Set the Auto Pivot to On (default) to automatically rotate the camera 180° when following a subject traveling directly beneath the camera. To disable this feature, click Off.

Freeze frame

Select On to freeze the image while the camera moves to a predetermined scene position.

Azimuth

Select On to display azimuth/elevation readings.

Select Off to hide azimuth/elevation readings.

Maximum pan speed [%]

Select the maximum pan speed (in percent). Settings range from 1 to 100. The default is 100.

Note: If you would like to pan/tilt manually, or to use recording Tour A / Tour B, while using the “IVA while moving” feature, then you must set the value in this field to <6.

Maximum tilt speed [%]

Select the maximum tilt speed (in percent). Settings range from 1 to 100. The default is 100.

Note: If you would like to pan/tilt manually, or to use recording Tour A / Tour B, while using the “IVA while moving” feature, then you must set the value in this field to <6.

Tracking zoom-out limit [%]

This parameter defines the zoom ratio percentage to which the camera zooms out after Tracking idel time [s] stops tracking, or if Intelligent Tracking loses visibility of an object being tracked. This allows the camera to re-acquire the target in a new, wider FoV. Settings range from 0 to 100. The default is 50.

Tracking idle time [s]

This parameter allows the camera to stop tracking motion of certain objects, such as a tree or a flag swaying in the wind, in a confined area after the specified number of seconds. Settings range from 5 to 120. The default is 30.

Auto pan left limit

Sets the left Auto Pan limit of the camera. Use the preview window to move the camera to the left pan limit and click the button. The camera will not move past this limit when in Auto Pan Between Limits mode (AUX 2 ON).

Auto pan right limit

Sets the right Auto Pan limit of the camera. Use the preview window to move the camera to the right pan limit and click the button. The camera will not move past this limit when in Auto Pan Between Limits mode (AUX 2 ON).

Tilt up limit

Sets the upper tilt limit of the camera. Use the preview window to move the camera to the tilt limit and click the button.

Pan limit left

Set the appropriate pan limit on the left.

Pan limit right

Set the appropriate pan limit on the right.

Tour A / Tour B

Starts and stops the recording of a recorded (guard) tour.

The camera can make up to two (2) recorded tours. A recorded tour saves all manual camera movements made during the recording, including its rate of pan, tilt and zoom speeds, and other lens setting changes. The tour does not capture camera video during the recording of the tour.

Note 1: You can save a total of 15 minutes of recorded actions between the two tours.

To record a tour:

1. Click the Start Recording button. The system prompts you to overwrite the existing tour.
2. Click Yes to overwrite the existing tour movements.
3. Click the View Control link, under the image cameo, to access the directional and zoom controls.
4. Use the View Control dialog box to make the necessary camera movements.
5. Click the Stop Recording button to save all actions.

Note: **Tour B** is now intended for use with the 'IVA while moving' functions.

Compass

The camera allows a user to display the compass heading of the camera in the lower-right corner of the image display. The camera displays the cardinal or intercardinal (N, NE, E, SE, S, SW, W, NW) heading in which the camera is pointing.

**Notice!**

The compass feature is not compatible with Bosch's Intelligent Tracking feature. If Intelligent Tracking is activated, the camera automatically disables the display of the compass heading. Once Intelligent Tracking is deactivated, the camera returns the compass heading to the display.

You must first calibrate the camera to North before the camera displays accurate compass headings. The camera uses this calibration, usually set to magnetic North, as the zero degree pan position and as the North compass heading. The camera then displays the compass heading based on the number of degrees from the North calibration point.

To set the North calibration point:

1. Determine the North compass heading, then move the camera to that position.
2. Select the radio button **On** for the parameter **Compass**.
3. Click the button next to **North point** to set the calibration point.

North point

- Click the **Set** button to overwrite the existing **North point**. A dialog box appears with the message, “Overwrite **North point**?” To confirm, click **OK**. To cancel, click **Cancel**.
- Click the **Clear** button to reset the **North point** to factory defaults. A dialog box appears with the message, “Reset **North point** to factory defaults?” To confirm, click **OK**. To cancel, click **Cancel**.

6.9 Scene Mode Scheduler

The scene mode scheduler is used to determine which scene mode should be used during the day and which scene mode should be used during the night.

1. Select the mode you wish to use during the day from **Marked range** drop-down box.
2. Select the mode you wish to use during the night from **Unmarked range** drop-down box.
3. Use the two slider buttons to set the **Time ranges**.

6.10 Pre-positions and Tours

The camera can store up to 256 preset scenes. You can define the individual scenes that comprise a **Pre-position Tour**.

You define individual pre-position scenes, then use these scenes to define the **Pre-position Tour**. The tour starts from the lowest scene number in the tour and progresses sequentially to the highest scene number in the tour. The tour displays each scene for a specified dwell time before advancing to the next scene.

By default, all scenes are part of the **Pre-position Tour** unless removed.

To define a Pre-position Tour:

1. Create the individual pre-positions.
By default, all scenes in the list **Pre-positions** are in the **Pre-position Tour**.
2. To remove a pre-position from the tour, select the pre-position in the list and uncheck the box **Include in standard tour (marked with *)**.
3. Select a dwell time from the drop-down list **Standard pre-position tour**.
4. To start the **Pre-position Tour**:
Return to the **Live** page.
Click **AUX Control**.
Type **8** in the input box and click **AUX on**.
5. To stop the tour, type **8** and click **AUX off**.

6.11 Pre-position mapping

Pre-position mapping allows you to map a function to a Show or Set action.

Action

Select the appropriate action: Show or Set.

Pre-position

Enter the number of the pre-position to map.

Function

Select the appropriate function from the drop-down list.

6.12 Sectors

Sector

The camera's pan capability is divided into equal sectors (2, 4, 8, 16), as defined in **PTZ Settings > Number of sectors**, for a total of 360°.

To define a title for sectors:

1. Place the cursor in the input box to the right of the sector number.
2. Type a title for the sector, up to 20 characters long.
3. To blank the sector, click the check box to the right of the sector title.

6.13 Miscellaneous

Fast address

This parameter allows the appropriate camera to be operated via the numerical address in the control system. Enter a number between 0000 and 9999, inclusive, to identify the camera.

Thermal FastAddress

Enter the number (between 0000 and 9999, inclusive) that corresponds to the numerical address of the thermal camera in the control system. The default value is 1.

6.14 Wiper/Washer

Wiper

Controls the wiper of the MIC cameras. Options are:

- Off: Turns off the wiper.
- On: Wiper wipes continuously until deactivated manually, or until it has been on for five minutes (after which the camera will stop the wiper automatically).
- Intermittent: Wipes twice, then stops. Every 15 seconds, this cycle repeats until users select another option in this field.
- One shot: Wipes five times, then turns off.

Wiper/washer

Click Start to start the wiper/washer. Click Stop to stop the wiper/washer.

6.15 Audio

Audio

You can set the gain of the audio signals to suit your specific requirements. The live video image is shown in the window to help you check the audio source. Your changes are effective immediately.

If you connect via Web browser, you must activate the audio transmission on the '**Live**' **functions** page. For other connections, the transmission depends on the audio settings of the respective system.

The audio signals are sent in a separate data stream parallel to the video data, and so increase the network load. The audio data is encoded according to the selected format and requires additional bandwidth. If you do not want any audio data to be transmitted, select **Off**.

Input volume

Set the input volume using the slide. Values range from 0 to 236.

Line Out

Set the line output gain using the slider. Values range from 0 to 143.

Recording format

Select a format for audio recording. The default value is **AAC 48 kbps**. You can select **AAC 80 kbps**, G.711 or L16 depending on the required audio quality or sampling rate.

AAC audio technology is licensed by Fraunhofer IIS.

(<http://www.iis.fraunhofer.de/amm/>)

6.16 Pixel Counter

The number of horizontal and vertical pixels covered by the highlighted area is displayed below the picture. With these values you can check whether the requirements for specific functions, for example, identification tasks, are fulfilled.

1. Click **Freeze** to freeze the camera image if the object that you want to measure is moving.
2. To reposition a zone, place the cursor over the zone, hold down the mouse button and drag into position.
3. To change the shape of a zone, place the cursor over the edge of the zone, hold down the mouse button and drag the edge of the zone to the required position.

7 Recording

7.1 Introduction to Recording

Images can be recorded to an appropriately configured iSCSI system or directly to local memory storage media inside the camera.

For shorter storage times and temporary recordings, the local memory media inside the camera is the ideal solution. It can be used for local alarm recording or to improve the overall reliability of video recording. For long-term, authoritative images, use an appropriately sized iSCSI system.

Two recording tracks are available (Recording 1 and Recording 2). The encoder streams and profiles can be selected for each of these tracks for both standard and alarm recordings. Ten recording profiles are available where these recording tracks can be defined differently. These profiles are then used for building schedules.

A Video Recording Manager (VRM) can control all recording when accessing an iSCSI system. The VRM is an external program for configuring recording tasks for video servers.

7.2 Storage Management

7.2.1 Device manager

An external Video Recording Manager (VRM) system for the unit is configured via the Configuration Manager. The **Managed by Video Recording Manager software** box is only an indicator; it cannot be changed here.

If the **Managed by Video Recording Manager software** box is checked, you are not able to configure any further recording settings on this page.

7.2.2 Recording media

Select a media tab to connect to the available storage media.

iSCSI Media

To use an **iSCSI system** as the storage medium, a connection to the desired iSCSI system is required to set the configuration parameters.

The storage system selected must be available on the network and completely set up. It must have an IP address and be divided into logical drives (LUNs).

1. Enter the IP address of the required iSCSI destination in the **iSCSI IP address** field.
2. If the iSCSI destination is password protected, enter the password into the **Password** field.
3. Click **Read**.
 - The connection to the IP address is established.

The **Storage overview** field displays the logical drives.

Local Media

Embedded local storage memory in the camera can be used for local recording.

- To use the embedded local storage memory for Automatic Network Replenishment (ANR), select the check box.

- If embedded local storage memory is password-protected, enter the password into the **Password** field.

The **Storage overview** field displays the local media.

Note: For more information about Automatic Network Replenishment (ANR), refer to the White Paper "ANR 2.0 Automatic Network Replenishment (ANR)," available on the product page for your camera. Access the product page on the online product catalog from <http://www.boschsecurity.com/corporate/product-catalog/index.html>.

7.2.3 Activating and configuring storage media

Available media or iSCSI drives must be transferred to the **Managed storage media** list, activated, and configured for storage.

Note:

A iSCSI target storage device can only be associated with one user. If a target is being used by another user, ensure that the current user no longer needs the target before decoupling that user.

1. In the **Storage overview** section, double-click a storage medium, an iSCSI LUN or one of the other available drives.
 - The medium is added as a target in the **Managed storage media** list.
 - Newly added media is shown as **Not active** in the **Status** column.
2. Click **Set** to activate all media in the **Managed storage media** list.
 - The **Status** column shows all media as **Online**.
3. Check the box in the **Rec. 1** or **Rec. 2** column to specify the recording tracks to be recorded on the target selected.

7.2.4 Formatting storage media

All recordings on a storage medium can be deleted at any time. Check the recordings before deleting and back-up important sequences on the computer's hard drive.

1. Click a storage medium in the **Managed storage media** list to select it.
2. Click **Edit** below the list.
3. Click **Format** in the new window to delete all recordings in the storage medium.
4. Click **OK** to close the window.

7.2.5 Deactivating storage media

A storage medium in the **Managed storage media** list can be deactivated. It is then no longer used for recordings.

1. Click a storage medium in the **Managed storage media** list to select it.
2. Click **Remove** below the list. The storage medium is deactivated and removed from the list.

7.3 Recording Profiles

A recording profile contains the characteristics of the tracks that are used for recording. These characteristics can be defined for ten different profiles. The profiles can then be assigned to days or times of day on the **Recording Scheduler** page.

Each profile is color-coded. The names of the profiles can be changed on the **Recording Scheduler** page.

To configure a profile, click its tab to open its settings page.

- To copy the currently visible settings to other profiles, click **Copy Settings**. A window opens to select the target profiles for the copied settings.
- If you change a profile's settings, click **Set** to save.
- If necessary, click **Default** to return all settings to their factory defaults.

Stream profile settings

Select the encoder profile setting that is to be used with stream 1 and 2 when recording. This selection is independent of the selection for live stream transmission. (The properties of the encoder profiles are defined on the **Encoder Profile** page.)

Pre-position

Select the appropriate pre-position to record. Options are **Tour A**, **Tour B**, **Custom Tour**, and configured pre-positions.

Recording includes

You can specify whether, in addition to video data and metadata (for example alarms, VCA data and serial data) should also be recorded. Including metadata could make subsequent searches of recordings easier but it requires additional memory capacity.



Caution!

Without metadata, it is not possible to include video content analysis in recordings.

Standard recording

Select the mode for standard recordings:

- **Continuous**: the recording proceeds continuously. If the maximum recording capacity is reached, older recordings are overwritten automatically.
- **Pre-alarm**: recording takes place in the pre-alarm time, during the alarm and during the post-alarm time only.
- **Off**: no automatic recording takes place.

Stream

Select the stream to be used for standard recordings:

- **Stream 1**
- **Stream 2**
- **I-frames only**

Alarm recording

Select a period for the **Pre-alarm time** from the list box.

Select a period for the **Post-alarm time** from the list box.

Alarm stream

Select the stream to be used for alarm recordings:

- **Stream 1**
- **Stream 2**
- **I-frames only**

Check the **encoding interval and bit rates from profile**: box and select an encoder profile to set the associated encoding interval for alarm recording.

Check the **Export to account** box to send standard H.264 or H.265 files to the target whose address is displayed.

If the target has not yet been defined, click **Configure accounts** to jump to the **Accounts** page where the server information can be entered.

Alarm triggers *

Select the alarm type that is to trigger an alarm recording:

- **Alarm input**
- **Analysis alarm**
- **Video loss**

Select the **Virtual alarm** sensors that are to trigger a recording, via RCP+ commands or alarm scripts, for example.

7.4 Maximum Retention Time

Recordings are overwritten when the retention time entered here has expired.

- Enter the required retention time in days for each recording track and for both camera streams (visible and thermal).

Make sure that the retention time does not exceed the available recording capacity.

7.5 Recording Scheduler

The recording scheduler allows you to link the created recording profiles with the days and times at which the camera's images are to be recorded in the event of an alarm.

You can link any number of 15-minute intervals with the recording profiles for each day of the week. Moving the mouse cursor over the table displays the time below it. This aids orientation. In addition to the normal weekdays, you can define holidays that are not in the standard weekly schedule on which recordings are to apply. This allows you to apply a schedule for Sundays to other days with dates that fall on varying weekdays.

1. Click the profile you want to link in the **Time periods** field.
2. Click in a field in the table, hold down the mouse button and drag the cursor over all the periods to be assigned to the selected profile.
3. Use the right mouse button to deselect any of the intervals.
4. Click the **Select All** button to link all time intervals to the selected profile.
5. Click the **Clear All** button to deselect all of the intervals.
6. When you are finished, click the **Set** button to save the settings in the unit.

Holidays

You can define holidays that are not in the standard weekly schedule on which recordings are to apply. This allows you to apply a schedule for Sundays to other days with dates that fall on varying weekdays.

1. Click the **Holidays** tab. Any days that have already been selected will be shown in the table.
2. Click the **Add** button. A new window will open.
3. Select the desired date from the calendar. You can select several consecutive calendar days by holding down the mouse button. These will later be displayed as a single entry in the table.
4. Click **OK** to accept the selection. The window will close.
5. Assign the individual holidays to the recording profiles, as described above.

Deleting Holidays

You can delete holidays you have defined yourself at any time.

1. Click the **Delete** button. A new window will open.
2. Click the date you wish to delete.
3. Click **OK**. The item will be deleted from the table and the window will close.
4. The process must be repeated for deleting additional days.

Time periods

You can change the names of the recording profiles.

1. Click a profile and then the **Rename** button.
2. Enter your chosen name and then click the **Rename** button again.

Activating the Recording

After completing configuration you must activate the recording scheduler and start the recording. Once recording is underway, the **Recording Profiles** and **Recording Scheduler** pages are deactivated and the configuration cannot be modified.

You can stop the recording activity at any time and modify the settings.

1. Click the **Start** button to activate the recording scheduler.
2. Click the **Stop** button to deactivate the recording scheduler. Running recordings are interrupted and the configuration can be changed.

Recording status

The graphic indicates the recording activity of the camera. You will see an animated graphic while recording is taking place.

7.6**Recording Status**

Details of the recording status are displayed here for information. These settings cannot be changed.

8

Alarm

8.1

Alarm Connections

You can select how the camera responds to an alarm. In the event of an alarm, the unit can automatically connect to a pre-defined IP address. You can enter up to ten IP addresses to which the camera will connect in sequence in the event of an alarm, until a connection is made.

Connect on alarm

Select **On** so that the camera automatically connects to a predefined IP address in the event of an alarm.

By setting **Follows input 1***, the unit maintains the connection that has been automatically established for as long as an alarm exists on alarm input 1.



Notice!

In the default setting, Stream 2 is transmitted for alarm connections. Consider this when assigning the profile (see Encoder Profile).

Number of destination IP address

Specify the numbers of the IP addresses to be contacted in the event of an alarm. The unit contacts the remote stations one after the other in the numbered sequence until a connection is made.

Destination IP address

For each number, enter the corresponding IP address for the desired remote station.

Destination password

If the remote station is password protected, enter the password here.

Only ten passwords can be defined here. Define a general password if more than ten connections are required. The unit connects to all remote stations protected by the same general password. To define a general password:

1. Select 10 in the **Number of destination IP address** list box.
2. Enter 0.0.0.0 in the **Destination IP address** field.
3. Enter the password in the **Destination password** field.
4. Set the user password of all the remote stations to be accessed using this password. Setting destination 10 to the IP-address 0.0.0.0 overrides its function as the tenth address to try.

Video transmission

If the unit is operated behind a firewall, select **TCP (HTTP port)** as the transfer protocol. For use in a local network, select **UDP**.



Caution!

Please note that in some circumstances, a larger bandwidth must be available on the network for additional video images in the event of an alarm, in case Multicast operation is not possible. To enable Multicast operation, select the **UDP** option for the **Video transmission** parameter here and on Network Access.

Stream

Select the number of the stream from the drop-down list.

Remote port

Depending on the network configuration, select a browser port here. The ports for HTTPS connections will be available only if the **On** option is selected in the **SSL encryption** parameter.

Video output

If you know which unit is being used as the receiver, you can select the analog video output to which the signal should be switched. If the destination unit is unknown, it is advisable to select the **First available** option. In this case, the image is placed on the first free video output. This is an output on which there is no signal. The connected monitor only displays images when an alarm is triggered. If you select a particular video output and a split image is set for this output on the receiver, you can also select from **Decoder** the decoder in the receiver that is to be used to display the alarm image.

**Notice!**

Refer to the destination unit documentation concerning image display options and available video outputs.

Decoder

If a split image is set for the selected video output, select a decoder to display the alarm image. The decoder selected determines the position in the split image.

SSL encryption

SSL encryption protects data used for establishing a connection, such as the password. By selecting **On**, only encrypted ports are available for the **Remote port** parameter. SSL encryption must be activated and configured on both sides of a connection. The appropriate certificates must also have been uploaded. (Certificates can be uploaded on the **Maintenance** page.)

Configure and activate encryption for media data (such as video, metadata or audio when available) on the **Encryption** page (encryption is only available if the appropriate license is installed).

Auto-connect

Select the **On** option to automatically re-establish a connection to one of the previously specified IP addresses after each reboot, after a connection breakdown or after a network failure.

**Notice!**

In the default setting, Stream 2 is transmitted for automatic connections. Bear this fact in mind when assigning the profile (see Encoder Profile).

The following field may or may not appear, depending on your camera:

Audio

Select **On** to activate audio alarms.

The following field may or may not appear, depending on your camera:

Default camera

Select the camera whose image is automatically displayed first on the receiver when the alarm connection is made. The numbering follows the labeling of the video inputs on the device. Depending on the system configuration, the receiver can then select the other cameras as well.

8.2 Video Content Analysis (VCA)

Note: This section of the manual provides an overview of the fields and the options for each field on the page **VCA**. This section is not a complete tutorial of setting up **VCA**. For more information, refer to the separate manual *Video Content Analysis (VCA)*, available on the product page for Intelligent Video Analytics. Access the product page on the online product catalog from <http://www.boschsecurity.com/corporate/product-catalog/index.html>. When you access the **VCA** menu, the left tab (Video 1) is selected. The Video 1 tab displays the **VCA** options for the visible camera.

To configure **VCA** options for the thermal camera, select the right tab (Video 2 / **Camera 2**).

VCA configuration

Select one of the profiles here to activate it or edit it.

You can rename the profile.

1. To rename the file, click the icon to the right of the list field and enter the new profile name in the field.
2. Click the icon again. The new profile name is saved.

Do not use any special characters, for example **&**, in the name. Special characters are not supported by the system's internal management.

If you select the option Silent VCA, then the system creates metadata to facilitate searches of recordings but no alarm is triggered. You cannot change any parameters for this configuration. If you want to turn off VCA, then select Off.

If necessary, click the button **Default** to return all settings to their default values. A dialog box appears with the message, "**Configuration of the video content analysis (VCA) will be reset to factory defaults. The changes will be lost. Click 'OK' to continue.**" Click **OK** to acknowledge the message, or click **Cancel**.

Alarm status

The alarm status is displayed here for information purposes. This means you can check the effects of your settings immediately.

Aggregation time [s]

Set an aggregation time of between 0 and 20 seconds. The aggregation time always starts when an alarm event occurs. It extends the alarm event by the value set. This prevents alarm events that occur in quick succession from triggering several alarms and successive events in a rapid sequence. No further alarm is triggered during the aggregation time.

The post-alarm time set for alarm recordings only starts once the aggregation time has expired.

Analysis type

Select the appropriate option for Video Content Analysis: MOTION+, Intelligent Video Analytics, or Intelligent Video Analytics Flow.

Note: When you select another analysis type, a dialog box appears with the message, "**Changing the analysis type resets motion and tamper parameters.**" Click **OK** to acknowledge the message (and to switch analysis types), or click **Cancel**.

Tamper detection

Detect tampering of cameras and video cables by means of various options. Run a series of tests at different times of the day and night to ensure that the video sensor is operating as intended.

Sensitivity and **Trigger delay [s]** can only be changed if **Reference check** is selected.

Reference check

Save a reference image that can be continuously compared with the current video image. If the current video image in the marked areas differs from the reference image, an alarm is triggered. This detects tampering that would otherwise not be detected, for example, if the camera is turned.

1. Click **Reference** to save the currently visible video image as a reference.
2. Click **Mask...** and select the areas in the reference image that are to be monitored.
3. Check the box **Reference check** to activate the on-going check. The stored reference image is displayed in black and white below the current video image, and the selected areas are marked in yellow.
4. Select the **Disappearing edges** or **Appearing edges** option to specify the reference check once again.

Trigger delay [s]

Set delayed alarm triggering here. The alarm is only triggered after a set time interval in seconds has elapsed and then only if the triggering condition still exists. If the original condition has been restored before this time interval elapses, the alarm is not triggered. This avoids false alarms triggered by short-term changes, for example, cleaning activities in the direct field of vision of the camera.

Global change

You can set how large the global change in the video image must be for an alarm to be triggered. This setting is independent of the sensor fields selected under **Select Area**. Set a high value if fewer sensor fields need to change to trigger an alarm. With a low value, it is necessary for changes to occur simultaneously in a large number of sensor fields to trigger an alarm.

This option allows you to detect, independently of motion alarms, manipulation of the orientation or location of a camera resulting from turning the camera mount bracket, for instance.

Global change

Activate this function if the global change, as set with the **Global change** slide control, should trigger an alarm.

Scene too bright

Activate this function if tampering associated with exposure to extreme light (for instance, shining a flashlight directly on the lens) should trigger an alarm. The average brightness of the scene provides a basis for recognition.

Scene too dark

Activate this function if tampering associated with covering the lens (for instance, by spraying paint on it) should trigger an alarm. The average brightness of the scene provides a basis for recognition.

8.3

Virtual Masks

Note: This section applies only to the visible camera.

Virtual masks allow users to mask parts of the scene which should not be considered for flow analysis to trigger Intelligent Tracking. This allows users to mask background motion in the scene such as moving trees, pulsating lights, busy roads, etc.

To create a virtual mask:

1. Select the number of the Virtual mask. In the video preview window, a dark grey rectangle appears with the text "Mask x," where 'x' is the number of the mask.

2. Select the mask with your mouse. Move the mouse to position the mask over the area of the view that you want to mask, and then click "Set." The text "VM Configuration active!" appears in the View Control window.

3. Click Enabled to enable the virtual mask. The rectangle that represents the mask in the preview window becomes red. The text "Virtual Masks: ENABLED" appears in the View Control window.

To disable virtual masks:

Click the Disable masks checkbox. The text "Virtual Masks: DISABLED" appears in the View Control window.

8.4

Audio Alarm

The camera can create alarms on the basis of audio signals. You can configure signal strengths and frequency ranges in such a way that false alarms, for example due to machine noise or background noise, are avoided.



Notice!

First set up normal audio transmission before you configure the audio alarm here (see Audio).

Audio alarm

Select **On** if you want the device to generate audio alarms.

Do not use any special characters, for example **&**, in the name. Special characters are not supported by the system's internal management.

Signal Ranges

You can exclude particular signal ranges in order to avoid false alarms. For this reason the total signal is divided into 13 tonal ranges (mel scale). Check or uncheck the boxes below the graphic to include or exclude individual ranges.

Threshold

Set up the threshold on the basis of the signal visible in the graphic. You can set the threshold using the slide control or, alternately, you can move the white line directly in the graphic using the mouse.

Sensitivity

You can use this setting to adapt the sensitivity to the sound environment. You can effectively suppress individual signal peaks. A high value represents a high level of sensitivity.

8.5

Alarm E-Mail

As an alternative to automatic connecting, alarm states can also be documented by e-mail. In this way it is possible to notify a recipient who does not have a video receiver. In this case, the camera automatically sends an e-mail to a previously defined e-mail address.

Send alarm e-mail

Select **On** if you want the unit to automatically send an alarm e-mail in the event of an alarm.

Mail server IP address

Enter the IP address of a mail server that operates on the SMTP standard (Simple Mail Transfer Protocol). Outgoing e-mails are sent to the mail server via the address you entered. Otherwise leave the box blank (**0.0.0.0**).

SMTP port

Select the appropriate SMTP port.

SMTP user name

Enter a registered user name for the chosen mailserver here.

SMTP password

Enter the required password for the registered user name here.

Format

You can select the data format of the alarm message.

- **Standard (with JPEG)** E-mail with attached JPEG image file.
- **SMS** E-mail in SMS format to an e-mail-to-SMS gateway (for example to send an alarm by cellphone) without an image attachment.

**Caution!**

When a cellphone is used as the receiver, make sure to activate the e-mail or SMS function, depending on the format, so that these messages can be received.

You can obtain information on operating your cellphone from your cellphone provider.

Image size

Select the appropriate image size: Small, Medium, Large, 720p, 1080p, **Best possible**.

Attach JPEG from camera

Click the checkbox to specify that JPEG images are sent from the camera. An enabled video input is indicated by a check mark.

VCA overlays

Select the **VCA overlays** check box, to place the outline of the object that triggered an alarm into the camera image sent as snapshot via e-mail.

Destination address

Enter the e-mail address for alarm e-mails here. The maximum address length is 49 characters.

Sender address

Enter a unique name for the e-mail sender, for example the location of the device. This will make it easier to identify the origin of the e-mail.

Note: The name must include at least two character groups separated by a blank (for example, Parking Garage) in order for the system to generate an email from that name, as in “From Parking Garage”. Text with only one group of characters (for example, Lobby) will not generate an email.

Test e-mail

You can test the e-mail function by clicking the **Send Now** button. An alarm e-mail is immediately created and sent.

8.6**Alarm Task Editor**

Editing scripts on this page overwrites all settings and entries on the other alarm pages. This procedure cannot be reversed.

To edit this page, you should have programming knowledge and be familiar with the information in the Alarm Task Script Language document and the English language.

As an alternative to the alarm settings on the various alarm pages, enter the desired alarm functions in script form here. This will overwrite all settings and entries on the other alarm pages.

1. Click **Examples** under the Alarm Task Editor field to see some script examples. A new window opens.

2. Enter new scripts in the Alarm Task Editor field or change existing scripts in line with your requirements.
3. When finished, click **Set** to transmit the scripts to the device. If the transfer was successful, the message **Script successfully parsed.** is displayed over the text field. If it was not successful, an error message is displayed with further information.

8.7 Alarm Rules

An alarm rule can define which input(s) activate which output(s). Basically, an alarm rule allows you to customize the camera to respond automatically to different alarm inputs. To configure an alarm rule, specify one input from a physical connection, from a motion detection trigger, or from a connection to the camera's LIVE page. The physical input connection can be activated by dry contact devices such as pressure pads, door contacts, and similar devices.

Next, specify up to two (2) rule outputs, or the camera's response to the input. Outputs include a physical alarm output, an AUX command, or a preposition scene.

Select the appropriate option in the field **Input** (a physical alarm connection):

- **Video analytics/MOTION+**: If you select this option, then an alarm will begin when IVA or motion detection is activated.
- **Connection**: If you select this option, then an alarm will begin when an attempt is made to access the camera's IP address.
- **Time**: If you select this option, then an input field appears to the right. In this field, enter the time for the activation of the alarm in hours and minutes. (The default value is 00:00.)
- **Time range**: If you select this option, then two input fields appear to the right. In these fields, enter the time range for the activation of the alarm in hours and minutes. (The default values are 00:00 and 00:00.)

Select one of the following output commands for both Output 1 and Output 2 settings:

Note: Not all options are available for all cameras.

- **None**: no defined command.
- **AUX on**: defines a standard or custom keyboard ON command.
- **AUX off**: defines a standard or custom keyboard OFF command.
- **Pre-position**: defines a pre-position from shot 1-256. (Note: This option is not available for the input **Time range**.)

Click the checkbox **Enabled** to activate the alarm.

Click **Set** to save. The camera's system activates the alarm rules.

9 Interfaces

The **Alarm Inputs** and **Alarm Outputs** menus appear only if the camera is connected to the optional MIC-ALM-WAS-24 accessory device.

The **Serial port function** field appears only if the appropriate "third-party protocol" eLicense is installed.

9.1 Alarm Inputs

Active

Configure the alarm triggers for the unit.

Select **N.C.** (Normally Closed) if the alarm is to be triggered by opening the contact.

Select **N.O.** (Normally Open) if the alarm is to be triggered by closing the contact.

Select **N.C.S.** (Normally Closed Supervised) if the alarm is to be triggered by opening the contact.

Select **N.O.S.** (Normally Open Supervised) if the alarm is to be triggered by closing the contact.

A supervised alarm transmits both the alarm condition and the tamper condition. Depending on how the alarm is configured, a short or a break in the alarm's circuit can trigger the tamper signal.

(NCS and NOS contacts are only present on some cameras)

Name

You can enter a name for each alarm input. If the **Live** functions are configured accordingly, this name is displayed below the icon for the alarm input. You can also use the name in the Forensic Search program function as a filter option for quick search in recordings. Enter a unique and clear name here.



Caution!

Do not use any special characters, for example **&**, in the name.

Special characters are not supported by the system's internal management.

Note: This name appears in the **Digital I/O** section of the **Live** page.

9.2 Alarm Outputs

Idle state

Select **Open** if you want the relay to operate as an NO contact, or select **Closed** if the relay is to operate as an NC contact.

Operating mode

Select an operating mode for the relay.

For example, if you want an alarm-activated lamp to stay on after the alarm ends, select

Bistable. If you wish an alarm-activated siren to sound for ten seconds, for example, select **10 s**.

Select the event that triggers the output.

Output name

Enter a name for the alarm output.

Note: This name appears in the **Digital I/O** section of the **Live** page.

Toggle

Click the button to test the relay / output connection.

9.3

COM1

Serial port function

Select a controller or a protocol from the list matching the connected camera. If you wish to use the serial port to transmit transparent data, select **Transparent**. Select **Terminal** if you wish to operate the unit from a terminal.



Notice!

After selecting a controller or protocol, the remaining parameters in the window are set automatically and should not be changed apart of the camera ID.

Camera ID

If necessary, enter the ID of the peripheral you wish to control (for example a dome camera or pan/tilt). The entered ID relates to the peripheral that is connected to the first video input. For further video inputs, the ID is automatically counted up. The connected peripheral devices are addressed via the respective ID.

Baud rate

Select the value for the transmission rate in bps.

Data bits

The number of data bits per character cannot be changed.

Stop bits

Select the number of stop bits per character.

Parity check

Select the type of parity check.

Interface mode

Select the desired protocol for the serial interface.

10 Network

The settings on these pages are used to integrate the device into a network. Some changes only take effect after a reboot. In this case **Set** changes to **Set and Reboot**.

1. Make the desired changes.
2. Click **Set and Reboot**.

The device is rebooted and the changed settings are activated.

10.1 Network Services

This page shows an overview of all available network services. Use the checkbox to activate or deactivate a network service. Click on the settings symbol next to the network service to go to the settings page for this network service.

Select the appropriate network services from the list on the page:

- HTTP
- HTTPS
- RTSP
- RCP
- FTP
- SNMP
- ISCSI
- UPNP
- NTP Server
- Discover
- ONVIF Discover
- GB/T 28181
- Password reset mechanism

10.2 Network Access

The settings on this page are used to integrate the camera into an existing network.

Automatic IPv4 assignment

If a DHCP server is employed in the network for the dynamic assignment of IP addresses, you can activate acceptance of IP addresses automatically assigned to the camera.

Certain applications (Bosch Video Management System, Archive Player, Configuration Manager) use the IP address for the unique assignment of the unit. If you use these applications, the DHCP server must support the fixed assignment between IP address and MAC address, and must be appropriately set up so that, once an IP address is assigned, it is retained each time the system is rebooted.

If the network has a DHCP server for the dynamic assignment of IP addresses, select **On** or **On plus Link-Local** to automatically accept the DHCP-assigned IP address.

If no DHCP server is available select **On plus Link-Local** to automatically assign a Link-Local (Auto-IP) address.

For certain applications, the DHCP server must support the fixed assignment between IP address and MAC address, and must be appropriately set up so that, once an IP address is assigned, it is retained each time the system is rebooted.

IPv4

Fill in the 3 fields in this section of the screen.

IP address

Enter the desired IP address for the camera in this field. The IP address must be valid for the network.

Subnet mask

Enter the appropriate subnet mask for the selected IP address here.

Gateway address

If you want the unit to establish a connection to a remote location in a different subnet, enter the IP address of the gateway here. Otherwise leave the box blank (**0.0.0.0**).

IPv6

Consult with the network administrator before making changes to this section.

IP address

Enter the desired IP address for the camera in this field. The IP address must be valid for the network. A typical IPv6 address may resemble the following example:

2001:db8::52:1:1

Consult the network administrator for valid IPv6 address construction.

Prefix length

A typical IPv6 node address consists of a prefix and an interface identifier (total 128 bits). The prefix is the part of the address where the bits have fixed values or are the bits that define a subnet.

Gateway address

If you want the unit to establish a connection to a remote location in a different subnet, enter the IP address of the gateway here. Otherwise leave the box blank (**0.0.0.0**).

DNS server address 1 / DNS server address 2

The camera is easier to access if the unit is listed on a DNS server. If you wish, for example, to establish an Internet connection to the camera, it is sufficient to enter the name given to the unit on the DNS server as a URL in the browser. Enter the IP address of the DNS server here. Servers are supported for secure and dynamic DNS.

Video transmission

If the unit is operated behind a firewall, select **TCP (HTTP port)** as the transfer protocol. For use in a local network, select **UDP**.

**Notice!**

Multicast operation is only possible with the UDP protocol. The TCP protocol does not support multicast connections. The MTU value in UDP mode is 1,514 bytes.

HTTP browser port

Select a different HTTP browser port from the list if required. The default HTTP port is 80. If you want to allow only secure connections via HTTPS, you must deactivate the HTTP port. In this case, select **Off**.

HTTPS browser port

If you wish to allow browser access on the network via a secure connection, select an HTTPS browser port from the list if necessary. The default HTTPS port is 443. Select the **Off** option to deactivate HTTPS ports; only unsecured connections will now be possible.

The camera uses the TLS 1.0 encryption protocol. You may have to activate this protocol via your browser configuration. You must also activate the protocol for the Java applications (via the Java control panel in the Windows control panel).

**Notice!**

If you want to allow only secure connections with SSL encryption, you must select the **Off** option for each of the parameters **HTTP browser port**, **RCP+ port 1756** and **Telnet support**. This deactivates all unsecured connections. Connections will then only be possible via the HTTPS port.

You can activate and configure encryption of the media data (video and metadata) on the **Encryption** page (see Encryption).

Min. TLS version

Select the version for minimum Transport Layer Security (TLS).

HSTS

Select this option to use the web security policy HTTP Strict Transport Security (HSTS) to provide secure connections.

RCP+ port 1756

To exchange connection data, you can activate the unsecured RCP+ port 1756. If you want connection data to be transmitted only when encrypted, select the **Off** option to deactivate the port.

Interface mode ETH

Select the Ethernet link type for the ETH interface.

Options are:

- Auto
- 10 Mbps HD (half duplex)
- 10 Mbps FD (full duplex)
- 100 Mbps HD (half duplex)
- 100 Mbps FD (full duplex)

Network MSS (Byte)

You can set the maximum segment size for the IP packet's user data. This gives you the option to adjust the size of the data packets to the network environment and to optimize data transmission. Please comply with the MTU value of 1,514 bytes in UDP mode.

iSCSI MSS (Byte)

You can specify a higher MSS value for a connection to the iSCSI system than for the other data traffic via the network. The potential value depends on the network structure. A higher value is only useful if the iSCSI system is located in the same subnet as the camera.

Network MTU (Byte)

The value in the field defaults to 1514.

10.3**DynDNS****Enable DynDNS**

DynDNS.org is a DNS hosting service that stores IP addresses in a database ready for use. It allows you to select the camera via the Internet using a host name, without having to know the current IP address of the unit. You can enable this service here. To do this, you must have an account with DynDNS.org and you must have registered the required host name for the unit on that site.

**Notice!**

Information about the service, registration process and available host names can be found at DynDNS.org.

Provider

The value in this field defaults to `dyndns.org`. Select another option as necessary.

Host name

Enter the host name registered on DynDNS.org for the camera here.

User name

Enter the user name you registered at DynDNS.org here.

Password

Enter the password you registered at DynDNS.org here.

Force registration now

You can force the registration by transferring the IP address to the DynDNS server. Entries that change frequently are not provided in the Domain Name System. It is a good idea to force the registration when you are setting up the device for the first time. Only use this function when necessary and no more than once a day, to avoid the possibility of being blocked by the service provider. To transfer the IP address of the camera, click the **Register** button.

Status

The status of the DynDNS function is displayed here for information purposes. You cannot change any of these settings.

10.4

Advanced

The settings on this page are used to implement advanced settings for the network.

Operation

The operation mode determines how the camera communicates with Cloud-based Security and Services.

- Select **Auto** to allow the camera to poll the server a few times; if no contact is made, it stops polling.
- Select **On** to constantly poll the server.
- Select **Off** to block polling.

Cloud state

This field identifies any cloud-based services with which the camera communicates.

- If you have registered the device on a cloud-based service such as Bosch Remote Portal, then this field identifies this fact (“**Registered on Bosch Remote Portal**”).

Note: The button (**Connect to Bosch Remote Portal**) to connect to the device with that service is active.

- If you have not registered the device, then the message, “**Not running. (Automatic IP assignment not active)**“ appears.

Note: The button (**Connect to Bosch Remote Portal**) to connect to the device with that service is not active.

Authentication

If a RADIUS server is employed in the network for managing access rights, authentication must be activated here to allow communication with the unit. The RADIUS server must also contain the corresponding data.

To configure the unit, you must connect the camera directly to a computer using a network cable. This is because communication via the network is not enabled until the **Identity** and **Password** parameters have been set and successfully authenticated.

Identity

Enter the name that the RADIUS server is to use for identifying the camera.

Password

Enter the password that is stored in the RADIUS server.

TCP port

The device can receive data from an external TCP sender, for example an ATM or POS device, and store it as metadata. Select the port for TCP communication. Select Off to deactivate the TCP metadata function.

Sender IP address

Enter the IP address of the TCP metadata sender here.

Server IP

Enter the IP address of the server.

Server port (0=Off)

Enter the number of the server port.

Protocol

Select the appropriate protocol: **UDP**, **TCP**, or **TLS**.

10.5

Network Management

SNMP

The camera supports the SNMP V1 (Simple Network Management Protocol) for managing and monitoring network components, and can send SNMP messages (traps) to IP addresses. The unit supports SNMP MIB II in the unified code. If you wish to send SNMP traps, enter the IP addresses of one or two required target devices here.

If you select **On** for the **SNMP** parameter and do not enter an SNMP host address, the camera does not send them automatically, but only replies to SNMP requests. If you enter one or two SNMP host addresses, SNMP traps are sent automatically. Select **Off** to deactivate the SNMP function.

1. SNMP host address / 2. SNMP host address

If you wish to send SNMP traps automatically, enter the IP addresses of one or two required target units here.

SNMP traps

You can select which traps are to be sent.

1. Click **Select**. A list is opened.
2. Click the checkboxes to select the required traps. All the checked traps will be sent.
3. Click **Set** to accept the selection.

UPnP

Select **On** to activate UPnP communication. Select **Off** to deactivate it.

When the Universal Plug-and-Play (UPnP) function is activated, the unit responds to requests from the network and is automatically registered on the requesting computers as a new network device. This function should not be used in large installations due to the large number of registration notifications.

Note:

To use the UPnP function on a Windows computer, both the Universal Plug-and-Play Device Host and the SSDP Discovery Service must be activated.

The priority of the different data channels can be set by defining the DiffServ Code Point (DSCP). Enter a number between 0 and 252 as a multiple of four. For alarm video you can set a higher priority than for regular video and you can define a Post Alarm Time over which this priority is maintained.

10.6 Multicast

In addition to a 1:1 connection between an encoder and a single receiver (unicast), the camera can enable multiple receivers to receive the video signal from an encoder simultaneously. The device either duplicates the data stream itself and then distributes it to multiple receivers (Multi-unicast) or it sends a single data stream to the network, where the data stream is simultaneously distributed to multiple receivers in a defined group (Multicast). You can enter a dedicated multicast address and port for each stream. You can switch between the streams by clicking the appropriate tabs.



Notice!

Multicast operation requires a multicast-enabled network that uses the UDP and the Internet Group Management IGMP protocols. Other group management protocols are not supported. The TCP protocol does not support multicast connections.

A special IP address (class D address) must be configured for multicast operation in a multicast-enabled network.

The network must support group IP addresses and the Internet Group Management Protocol (IGMP V2). The address range is from 225.0.0.0 to 239.255.255.255.

The multicast address can be the same for multiple streams. However, it will be necessary to use a different port in each case so that multiple data streams are not sent simultaneously using the same port and multicast address.



Notice!

The settings must be made individually for each stream.

Enable

To enable simultaneous data reception on several receivers you need to activate the multicast function. To do this, check the box. You can then enter the multicast address.

Multicast Address

Enter a valid multicast address for each stream to be operated in multicast mode (duplication of the data streams in the network).

With the setting **0.0.0.0** the encoder for the relevant stream operates in multi-unicast mode (copying of data streams in the unit). The camera supports multi-unicast connections for up to five simultaneously connected receivers.



Notice!

Duplication of data places a heavy demand on the unit and can lead to impairment of the image quality under certain circumstances.

Port

Assign a different port to each data stream if there are simultaneous data streams at the same multicast address.

Enter the port address of the required stream here.

Streaming

Click the checkbox to activate multicast streaming mode for the relevant stream. An enabled stream is indicated by a check mark.

Multicast packet TTL

You can enter a value to specify how long the multicast data packets are active on the network. This value must be greater than one if multicast is to be run via a router.

10.7**Image Posting****Image size**

Select the appropriate image size: Small, Medium, Large, 720p, 1080p, **Best possible**.

File name

You can select how file names will be created for the individual images that are transmitted.

- **Overwrite** The same file name is always used and any existing file will be overwritten with the current file.
- **Increment** A number from 000 to 255 is added to the file name and automatically incremented by 1. When it reaches 255 it starts again from 000.
- **Date/time suffix** The date and time are automatically added to the file name. When setting this parameter, ensure that the unit's date and time are always correctly set. Example: the file snap011005_114530.jpg was stored on October 1, 2005 at 11:45 and 30 seconds.

VCA overlays

To include VCA overlays in the email, select this check box.

Posting interval

Enter the interval in seconds at which the images will be sent to an FTP server. Enter 0 (zero) if you do not want any images to be sent.

The following field may or may not appear, depending on your camera:

Post JPEG from camera

Click the checkbox to select the cameras from which JPEG images are sent. An enabled video input is indicated by a check mark.

For MIC IP fusion 9000i cameras, select checkbox 1 for the visible imager; select checkbox 2 for the thermal imager.

Target

Select the target—the name of the account on the server—to which to save images.

When face recognition is available, selected images of the face can be sent to a target account.

Enable

Check the box to enable best face posting.

File format

Select the type of image to be sent.

Target

Select the target account for best face posting.

Timeout

Fill in the timeout in seconds. Leave at 0 for no timeout.

Maximum image width [px]

Fill in the maximum image width in pixels. Leave at 0 for automatic width selection.

10.8**Accounts**

Four separate accounts can be defined for posting and recording export.

Type

Select either FTP or Dropbox for the account type.

Before using a Dropbox account ensure that the time settings of the device have been correctly synchronized.

Account name

Enter an account name to be shown as the target name.

IP address

Enter the IP address of the server on which you wish to save the JPEG images.

Login

Enter the login ID for the server.

Password

Enter the password that gives you access to the server. To verify the password, click the Check button to the right.

Path

Enter the exact path on which you wish to post the images on the server. To browse for the correct path, click the Browse button to the right.

Maximum bit rate

Enter the maximum bit rate for the JPEG images (in kbps).

Encryption

Tick the box to use a secure FTP over TLS connection.

10.9

IPv4 Filter

Use this setting to configure a filter that allows or blocks network traffic that matches a specified address or protocol.

IP Address 1 / 2

Enter the IPv4 address that you want to allow or block

Mask 1 / 2

Enter the subnet mask for the appropriate IPv4 address.

10.10

Encryption

If an encryption license is installed, this submenu gives access to the encryption parameters.

11

Service

11.1

Maintenance

Update server

The address of the update server appears in the address box.

1. Click **Check** to make a connection to this server.
2. Select the appropriate version for your camera to download the firmware from the server.

Firmware

The camera functions and parameters can be updated by uploading new firmware. To do this, the latest firmware package is transferred to the device via the network. The firmware is installed there automatically. Thus, a camera can be serviced and updated remotely without requiring a technician to make changes to the device on site. The latest firmware can be obtained from your customer service center or from the download area.



Notice!

Before starting a firmware update, make sure to select the correct upload file.

Do not interrupt the firmware installation. Even changing to another page or closing the browser window leads to interruption.

Uploading the wrong files or interrupting the upload can result in the device no longer being addressable, requiring it to be replaced.

Progress

The progress bar displays the progress of the firmware upload.

Note: Once the progress bar reaches 100%, a reset page may appear. If this page appears, allow the reset page to complete its action.

Upload history

Click **Show** to view the firmware upload history.

Configuration

Click **Browse...** to navigate to the required firmware file (*.fw).

Note: Ensure that the file to be loaded comes from the same unit type as the unit that you want to configure.

Click **Upload** to begin transferring the file to the unit. Click OK to the warning message to continue the firmware upload, or Cancel to stop the upload.

Click **Download** to save the camera settings to a file to upload to the same camera or to a similar camera in the future.

Maintenance log

You can download an internal maintenance log from the unit to send it to Customer Service for support purposes. Click **Download** and select a storage location for the file.

11.2

Licenses

This window is for the activation of additional functions by entering activation codes. An overview of installed licenses is shown. The installation code of the unit is also displayed here.

11.3

Certificates

Add a certificate/file to the file list

Click **Add**.

In the Add certificate window choose either:

- **Upload certificate** to select a file that is already available:
 - Click **Browse** to navigate to the required file.

- Click **Upload**.
- **Generate signing request** for a signing authority to create a new certificate:
 - Fill in all the required fields and click **Generate**.
- **Generate certificate** to create a new self-signed certificate:
 - Fill in all the required fields and click **Generate**.

Delete a certificate from the file list

Click the trashcan icon to the right of the certificate. The Delete file window appears. To confirm deletion, click OK. To cancel deletion, click Cancel.

Note: You can only delete certificates that you have added; you cannot delete the default certificate.

11.4 Logging

Current log level

Select the level of event for which to display log entries or to log.

Number of displayed entries

Select the number of entries to display.

11.5 Diagnostics

Accesses the Built-in Self Test (BIST). The BIST displays a Pass or Fail status on the most recent homing event, not a counter. For the other items, a counter is maintained.

Click the **Start Self test** button to display the number of times the camera:

- performed a homing event.
- failed to home properly.
- restarted.
- lost video.

Logs

This section updates automatically with the history of the camera and maintains a log of all events such as those listed below. Click the REFRESH button to reload log data.

11.6 System Overview

This window is for information only and cannot be modified. Keep this information at hand when seeking technical support.

Select the text on this page with a mouse and copy it so that it can be pasted into an e-mail if required.

12

12.1

Using your MIC Camera

Recommended Use of Your MIC Camera

Bosch recommends that you consider the following in order to optimize the life of your Bosch camera.

1. Guard Tours and Preset Tours

With your camera, you can cover a full 360° view using continuous Guard Tours or Preset Tours. Depending on the type of camera tour selected, your camera might be either in continuous motion (pan, tilt, or both) or moving between selected preset positions.

Continuous Guard Tours

Guard Tours are a very effective way of monitoring the entire scene; however, if not configured properly, continuous Guard Tours can reduce the service life of your camera considerably.

Continuous Guard Tours should be used in applications where the tours are required to run for a fixed duration during the day (not more than twelve hours/day). Additionally, for best results, the continuous guard tour should be used in scenes with sufficient illumination levels (50 lux or better), should be at least 60 seconds in duration, and should have a smooth pan/tilt path (without erratic stops and starts), with the lens set at a wide angle (infinity focus). The tour should also include at least 10° of tilt movement.

Note: **Tour B** is now intended for use with the 'IVA while moving' functions.

Preset Tours

For scenarios that require the camera to be in continuous motion for most of the day, Bosch recommends that you set the camera in Preset Tour mode, moving between a desired set of presets. For best results, always ensure that each preset has a dwell time of at least 5 seconds.

2. Scene Illumination and Focus Settings

Your camera uses a high-sensitivity image sensor and a high-quality lens with a precise drive train control to maintain the best focus of the image. The Autofocus mechanism tries continuously to make the image details appear sharp. Under low light and low contrast scenarios, the Autofocus algorithm may not be able to find the correct focus points because of the lack of detail in the scene. In this case, it will keep driving the focus motor to find the best focus. If this state continues for long, the focus mechanism of your camera could be damaged beyond repair.

For best results, maintain the scene illumination (visible light and/or IR illumination) to a level that allows the camera to easily resolve the details in the scene. The illumination requirements are site-specific and should be verified during camera installation and configuration. For best camera performance, the scene should have at least 50 lux of illumination.

For scenes where sufficient lux level cannot be maintained, the camera should be used with One Push ("Spot Focus"), and you should avoid using continuous Guard Tours.

3. Power-over-Ethernet (PoE)

Use only approved High PoE devices - those that Bosch recommends, or those that Bosch offers, such as a High PoE Midspan midspan or the VIDEOJET connect 7000 power supply - between the camera and your PoE network. Improper network connection can result in intermittent camera reboots. If the camera reboots frequently, test your camera with another power supply.

12.2 Using Intelligent Tracking

Configuring Intelligent Tracking

The camera utilizes the built-in Intelligent Video Analytics (IVA) to continuously follow an individual or object even if it passes behind a Privacy Mask or a stationary object. The camera uses objects detected by IVA in a stationary preset position to activate the Intelligent Tracking feature.

The Intelligent Tracking feature allows continuous on-screen following of an individual or an object. This feature operates by recognizing an object in motion and zooms in to approximately 50% (default Tracker zoom threshold) of the field of view for an average target height of six feet. This feature controls the pan/tilt/zoom actions of the camera to keep the selected object in the scene.

To activate the Intelligent Tracking feature, one of the following conditions must be met:

- The Silent IVA option must be selected in the VCA page on the Settings tab. Refer to *Video Content Analysis (VCA)*, page 51.
- IVA must be active for at least one preset scene in the VCA page on the Settings tab. If IVA is configured for one scene, then all other scenes have Intelligent Tracking enabled by default. If a scene has Motion+ of IVA Flow activated, however, then Intelligent Tracking is disabled for these scenes.



Notice!

The following actions occur if Intelligent Tracking is active:

All other IVA objects are disabled in scenes with Intelligent Tracking.

The camera automatically disables the display of compass headings. Once Intelligent Tracking is set to Off, the camera resumes display of the compass heading. Refer to *PTZ Settings*, page 39 for details of the Compass feature.

Guidelines for Implementing Intelligent Tracking

Factors such as the viewing angle and unwanted motion (from trees, for example) may interfere with Intelligent Tracking operation. Use the following recommendations to ensure smooth Intelligent Tracking operation:

- **Mount/Mounting Surface Stability**
 - Mount the camera in the most stable position. Avoid locations affected by vibrations, such as those caused by a roof-top air conditioner. These vibrations may cause complications when the camera zooms-in on a target.
 - Use the pendant arm mount, if possible. This mount option provides the most stability for the camera.
 - Use guy wires to protect against strong winds if using the parapet mount.
- **Field of View**
 - Select a location and viewing angle that allows the flow of people to move across the camera's field of view.
 - Avoid motion that moves directly towards the camera.
 - Avoid locations that attract large numbers of people, such as retail stores or intersections. Intelligent Tracking is optimized for scenes with very few moving objects.
- **Unwanted Motion**
 - Avoid neon lights, flashing lights, night time lights, and reflected light (from a window or mirror, for example). The flickering of these lights can affect the Intelligent Tracking operation.
 - Avoid motion from moving leaves/branches that present a persistent fixed motion.

Operation of Intelligent Tracking

The Intelligent Tracking feature behaves in one of the following ways:

- **Camera detects an object in motion and automatically tracks the object**
User actions always take precedence over Intelligent Tracking. If the camera is actively tracking an object and a user takes control, the camera will attempt to track the object after a period of inactivity.
- **An IVA alarm can trigger Intelligent Tracking to track a detected object**
A rule that triggers an IVA event must be set. The following standard tasks can be set: Object in field, Crossing Line, Loitering, Condition change, Following route, Entering field, and Leaving field. Refer to the *IVA 5.60 Operation Manual* for specific information.
- **A user manually selects an object in the live image area to track**
The Intelligent Tracking feature allows a user to click a moving object in the live image display inside the **LIVE** page to identify an object to track.
- **Use AUX Command 78 to activate/deactivate Intelligent Tracking**
Use AUX ON 78 to enable the Intelligent Tracking Auto mode. This command can be used in conjunction with the rules engine.





Using Intelligent Tracking

Use the following options on the **LIVE** page to control Intelligent Tracking:

Note: If you do not see these controls on the **LIVE** page, ensure that the **Show ‘Tracking’** option is enabled on the **LIVE Functions** page. Refer to *LIVE Functions, page 23*.

- **Off:** Disables Intelligent Tracking.
- **Auto:** In this mode, the camera actively analyzes the video to detect any moving object. If it detects movement, the camera begins to track the moving object. This mode is most useful for scenarios where no motion is expected in the scene.
- **Click:** In this mode, users can click an object moving in the live video image to enable the camera to track the movement of the selected object. This mode is most useful for scenarios where normal scene activity is expected.

If the Intelligent Tracking feature is set to Auto or Click, the live video image displays an eye icon with a symbol that conveys the state of Intelligent Tracking activity:

Graphic	Description	Explanation
	White eye, flashing	Intelligent Tracking is actively following a target.
	Gray eye with a red “X”	Intelligent Tracking lost the selected target and will wait for the target to reappear using the last known trajectory. During the IDLE state, the camera will not seek other objects in motion.
	Gray eye without a symbol	Intelligent Tracking is idle, waiting to track a target.
	Gray eye with a “pause” symbol	Intelligent Tracking attempts to track a target passively while a user has camera control.

Tracking triggered by IVA rules

In this mode, the camera continuously analyzes the scene for IVA alarms or IVA rule violations. If an IVA rule is violated, it triggers the advanced tracking feature of the camera to start following the object / person that triggered the alarm. This allows the camera to track moving objects of interest without getting distracted by other moving objects in the scene.

To activate this mode, you must enable IVA by selecting either *IVA [number]* or *IVA [number] Flow* in the field **Analysis type** of the page **VCA** (from the page **Configuration**, select **Alarm > VCA**). Refer to the current *Operation Manual for IVA Intelligent Video Analysis* for specific information.

If the option **Show VCA metadata** is selected in **'Live' functions** (from the page **Configuration**, select **Web Interface > 'Live' functions**), the live view will show the following metadata objects in the **Live** page view:

- Objects in motion are initially identified in the video.
- Actively tracked object in motion are identified in the video.
- When an object in motion is lost, a diamond appears designating the area where the target was lost.

Several reasons may cause the Intelligent Tracking to stop tracking a target:

- The target has stopped moving while being followed by Intelligent Tracking.
- The target has moved behind a static object in the scene.

In these instances, Intelligent Tracking switches to the IDLE mode (pink eye icon) and waits for the target to reappear in the scene. The camera will restart tracking if a target starts moving in the same area where the initial target stopped moving or if the camera detects an object moving along the last known trajectory.

12.3 Uploading a User Logo

Customers have the option to upload custom logos that display on the web browser of the device.

All user logo images must comply with the following requirements:

- The file format must be a bitmap (.bmp).
- Height and width must not exceed 128 pixels.
- Color depth must be 8 bit (256 color bitmap).

Upload the Logo File

1. If necessary, open the browser. Click **Configuration**.
2. Click **General**. Select **Display Stamping**.
3. Select the field **Camera name stamping**. Select the position of the logo: *Bottom*, *Top*, or *Custom*.
Note: If you select *Custom*, then additional fields (**Position (XY)**) appear where you can specify the exact position of the logo. In the fields **Position (XY)**, enter the values for the desired position (0 - 255).
4. Click **Logo Browse** to open a file-search dialog. Select the image file (.bmp).
5. Click **Upload** to transfer the file to the camera.
The message “Upload successful” should appear.
The new logo, if applicable, replaces the previous one.
6. Select the field **Logo position**. Select the position of the logo on either side of the camera name: *Left*, *Right*, or *Logo only*. (The default value is *Off*.)
7. Click Set to save.

Set Logo Transparency (Optional)

1. Click the check box **Transparent background**.
2. Click Set to save.
3. Note that the color of the entire first line of the logo is the color that will be changed to transparent in the remainder of the logo. For example, if the first line is white, then all of the identical white colors of the logo image will become transparent.

Change the Camera Title

1. Click **General**. Select **Identification**.
2. Delete all of the text in the field **Camera name**.
3. Rename the camera if desired.
4. Click Set to save.

12.4 Azimuth, Elevation, and Compass Directions

The camera can display the following data in the lower-right corner of the image display:

- **Azimuth** - The pan angle from zero to 359 degrees in one-degree increments. An azimuth of zero degrees corresponds to North.
- **Elevation** - The tilt position from zero (horizon) to -90 degrees (camera pointing straight down) in one-degree increments.
- **Compass** - The cardinal or intercardinal (N, NE, E, SE, S, SW, W, NW) heading in which the camera is pointing.

The camera allows users to display only the azimuth/elevation readings or only the compass reading, or both readings at the same time. The camera displays the azimuth/ elevation readings and the compass heading in a format such as “180 / -45 S,” where:

- 180 is the Azimuth or the pan location in degrees.
- -45 is the Elevation or the tilt location in degrees.
- S is the compass direction (cardinal or intercardinal).

The camera uses the azimuth to determine the compass direction. The following table shows the azimuth range and its corresponding compass heading:

Azimuth Range	Compass Direction
21° to 65° NE (Northeast)	66° to 110° E (East)
111° to 155° SE (Southeast)	156° to 200° S (South)
201° to 245° SW (Southwest)	246° to 290° W (West)
291° to 335° NW (Northwest)	336° to 20° N (North)
21° to 65° NE (Northeast)	66° to 110° E (East)
111° to 155° SE (Southeast)	156° to 200° S (South)
201° to 245° SW (Southwest)	246° to 290° W (West)
291° to 335° NW (Northwest)	336° to 20° N (North)

The camera uses the Azimuth Zero point, usually set to magnetic North, as the zero degree pan position and as the North compass heading. The camera then displays the azimuth reading and the compass heading based on the number of degrees from the Azimuth Zero point.



Notice!

Bosch recommends that only the installer calibrate the Azimuth Zero point. A recalibration to the Azimuth Zero point may cause inaccurate compass headings.

Set the Azimuth Zero point:

1. Determine the North compass heading, then move the camera to that position.
2. Use the command AUX OFF-90-ENTER to turn off the command lock (if active).
3. Use the command AUX ON-94-ENTER to set the Azimuth Zero point.

Display/hide the azimuth/elevation reading:

- Use the command AUX ON-95-ENTER to display the azimuth/elevation reading.
- Use the command AUX OFF-95-ENTER to hide the azimuth/elevation reading.

Display/hide the compass heading:

- Use the command AUX ON-96-ENTER to display the compass heading.
- Use the command AUX OFF-96-ENTER to hide the compass heading.

12.5 Using the Wiper/Washer (Bosch Protocol)

The "predefined position" for the wash/wipe function is preset 62. The installer must define preset 62 (preferably where the washer nozzle is located and can direct washer fluid towards the camera window) before using the wiper/washer function.

To activate the washer/wiper function, press ON-105-ENTER and confirm this sequence:

1. The wiper moves to a predefined position.
2. The washer turns on for five seconds. Simultaneously, the wiper turns on and wipes five times.
3. The washer turns off. The wiper turns off.
4. The camera returns to its previous PTZ position (and to inactive mode if applicable).

To activate the wiper manually (or if the corresponding alarm was activated or deactivated):

Press **ON-102-ENTER**.

Note: The wiper will turn off automatically after 5 minutes of use.

To activate intermittent wipe:

Press **ON-103-ENTER**. The wiper wipes twice, then returns to parked position, and then turns off 15 seconds later.

To activate the wiper to wipe five (5) times:

Press **ON-104-ENTER**. The wiper wipes five times, then returns to parked position and turns off.



Notice!

If the power fails while the wiper is activated, the wiper will return to parked position, after power is restored, before turning off. The wiper will not stop in front of the camera window.

12.6 Using the Wiper/Washer (Pelco Protocol)

To activate the washer/wiper in Pelco protocol, follow these steps:

1. From the **Configuration** page > Illumination/Wiper > Wiper/washer, click Start, and then exit the menu.
2. Position the camera so that the nozzle of the washer will spray the camera window.
3. Press 62 and then Preset. Press and hold "Preset" for 2 seconds until the text "Scene 62 Stored" appears on the OSD.

Note: If you already have a preset stored at that position, the system prompts you to overwrite the current scene.

4. Activate the wash/wiper function. Press 1 and then press AUX-ON on the keyboard. The camera moves to preset 62. The nozzle sprays cleaner onto the camera window, and then the wiper wipes the window. The camera then returns to where it was positioned previously, or it continues to perform the tour that it was performing when you activated the wash/wipe function.



Notice!

Depending on your camera settings, your monitor may display a freeze frame image of the wiper during or at the end of the wipe cycle. If you prefer not to see this freeze frame, you can turn off the Freeze Frame on Preposition in the PTZ Setup menu.

12.7 Flat Field Correction on Thermal Cameras

The thermal camera uses an internal process called flat-field correction (FFC) to improve the quality of the thermal video image displayed on the monitor. During this process, a shutter rotates in front of the Focal Plane Array (FPA) to give a uniform temperature (a flat field) to every detector element. During the process (which takes less than a second), the live thermal video image is frozen, and persists, while the camera updates correction coefficients. After the process completes, live video returns automatically. With a more uniform array output, the quality of the image should improve.

When the camera is powered on initially, the interval between FFC events ranges from 1 minute to 3 minutes. This frequency of FFC events ensures that the thermal imager will be corrected more often while the internal temperature of the camera stabilizes. After several minutes of camera operation, the interval between FFC events is approximately 6 minutes. In case of constant motion in the scene, FFC may be delayed up to 12 minutes.

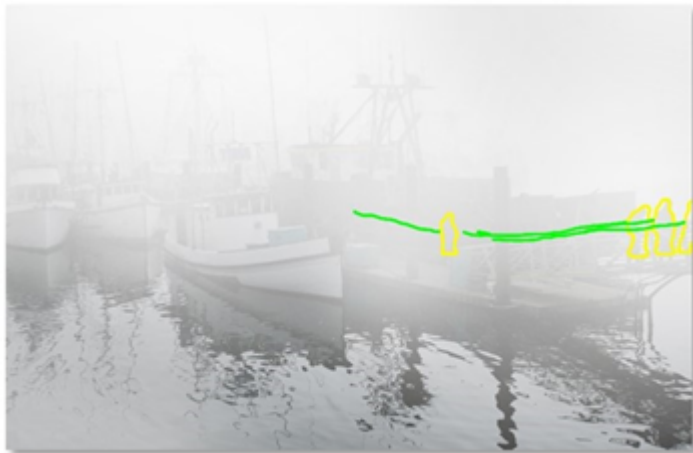
13 Understanding the Fusion Feature

The metadata fusion feature enables operators to receive notification of detected events from both thermal and visible image streams, regardless of which image stream they are viewing. This gives operators a much higher level of situational awareness, and eliminates the need to monitor both visible and thermal images constantly.

For example, a standard camera viewing a scene with limited visibility produces an image such as the one below.



The same scene viewed using the visible imager of the MIC IP fusion 9000i camera would include metadata fusion events detected by the thermal imager, as shown below.



Once alerted, operators can switch to the thermal image (below) of the scene, where they can easily see the objects creating the alarm. Hence, the metadata fusion feature provides enhanced situational awareness.



13.1 Video content analytics on the Live page

If the metadata fusion feature is enabled (that is, VCA is enabled for both the visible and thermal image streams), events generated by both visible and thermal image streams will appear on both the visible and thermal images.

If the metadata fusion feature is enabled (that is, VCA is enabled for both the visible and thermal image streams), trajectory lines will appear on both the visible and thermal image streams.

13.2 VCA marks on the live image

VCA marks (metadata and trajectories) appear on the live video image from the imager selected in the **Video** field in the **Connection** section of the **Live** page. This imager detected the objects that the VCA marks indicate.

The following screenshots and tables provide more information.

VCA marks on the visible image



Image from visible imager with VCA metadata and trajectory lines

VCA mark, metadata	What it indicates
A solid box	The visible imager detected an object.
A dotted box	The <i>thermal</i> imager detected an object.
VCA mark, trajectory line	What it indicates
A solid green trajectory line	The visible imager detected an object and indicated its trajectory.
A dotted green trajectory line	The <i>thermal</i> imager detected an object and indicated its trajectory.

VCA marks on the thermal image

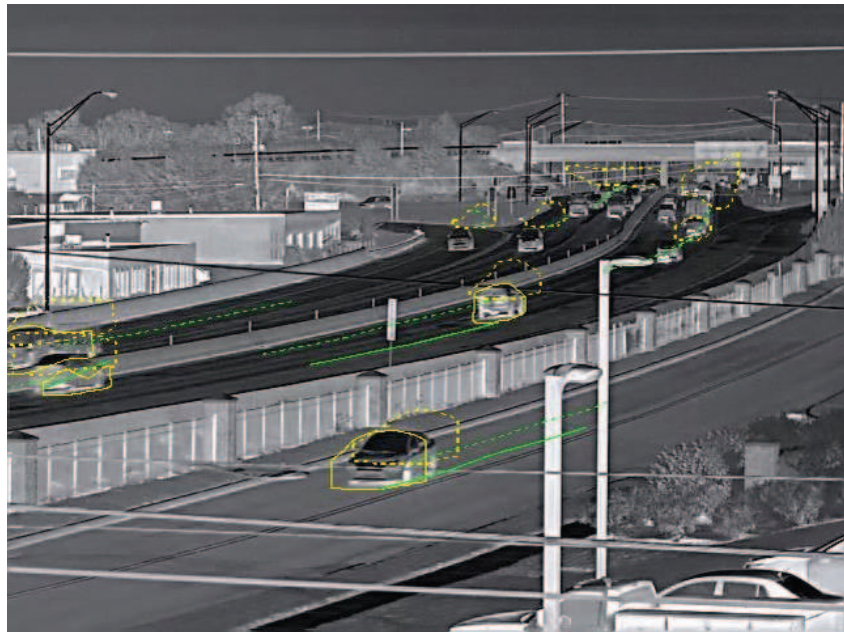


Image from thermal imager with VCA metadata and trajectory lines

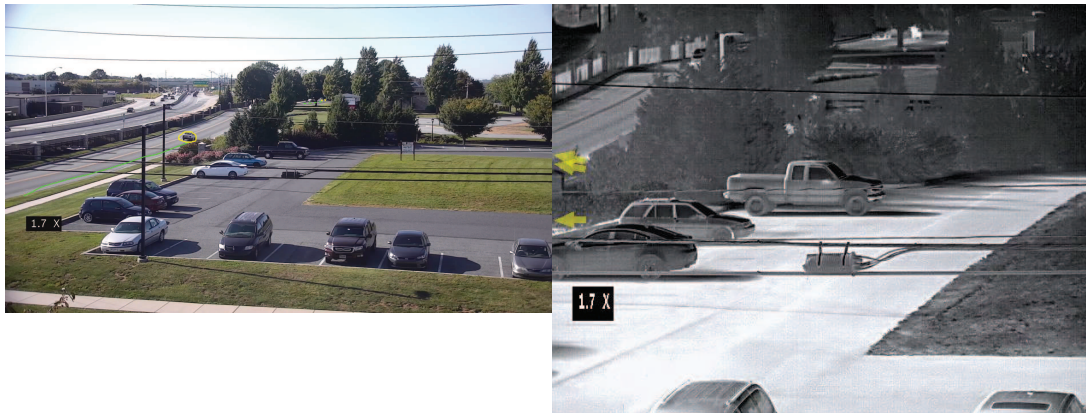
VCA mark, metadata	What it indicates
A solid box	The thermal imager detected an object.
A dotted box	The <i>visible</i> imager detected an object.
VCA mark, trajectory line	What it indicates
A solid green trajectory line	The thermal imager detected an object and indicated its trajectory.
A dotted green trajectory line	The <i>visible</i> imager detected an object and indicated its trajectory.

Depending on your use case, one imager may be better to use (more frequently) than the other.

VCA Indicators for objects outside the Field of View (FOV)

It is possible that the VCA on the image stream not currently being viewed may detect objects that are outside the field of view of the image stream that is being viewed.

For example, if the optical zoom lens on the visible imager is set to full wide angle, objects at the far right and left of the visible image will not be visible on the thermal image. In this situation, arrow symbols will appear on the thermal image to indicate that the VCA on the visible image is detecting objects. The following figure illustrates the objects and the arrow symbols.



The arrows at the left edge of the image on the right indicate the vehicle that is out of view of the thermal imager but in view of the visible imager. In the image on the left, from the visible imager, a yellow box identifies the vehicle.

14 Troubleshooting

Table of Troubleshooting Issues

The table below identifies issues that could occur with the camera, and how to resolve them.

Note: Refer to the Error Codes section of the manual for descriptions of the error codes that appear on the OSD. The section also lists recommended actions to resolve the error codes.

Problem	Questions to Ask/Actions to Resolve the Problem
No camera control.	<ul style="list-style-type: none"> – Ensure that the LAN cable has good connection and is secured. – Refresh the browser and ensure that video is updated. – Cycle the camera's power off and on. – Reboot the computer. – Refer to Status Code 17 in Error Codes.
Camera moves when attempting to move other cameras.	<ul style="list-style-type: none"> – Check that the camera's IP address is properly set. If the camera's IP address is not set, then: <ul style="list-style-type: none"> – Use Configuration Manager to confirm that two cameras do not have the same IP address. If they do, change the address of one of the cameras.
No Network Connection.	<ul style="list-style-type: none"> – Check all network connections. – Ensure that the maximum distance between any two Ethernet connections is 100 m (328 ft) or less. If OK, then if you are behind a firewall, ensure that the Video Transmission mode is set to UDP.
Camera does not operate at all, or does not operate as expected, after being subjected to extreme low temperatures (below -40 °C (-40 °F)).	<ul style="list-style-type: none"> - Allow the camera to warm up. The camera requires a 60-minute warm-up prior to PTZ operations. - If camera does not operate after this warm-up period, then reset the camera. In the URL line of your web browser, type "/reset" at the end of the IP address of the camera. – Refer to Status Code 7 in Error Codes.
The contrast on the screen is too weak.	<ul style="list-style-type: none"> – Adjust the contrast feature of the monitor. Is the camera exposed to strong light? If so, change the camera position. – Adjust the Optical or thermal camera picture settings for your scene as described in <i>Picture Settings, page 33</i> or <i>Picture Settings Thermal, page 36</i> in the User Manual.

Problem	Questions to Ask/Actions to Resolve the Problem
No video.	<ul style="list-style-type: none"> - Check that the mains power to the power supply is on. - If providing power via 24VAC, ensure that the 24VAC voltage at the camera is between 21VAC and 30VAC. - If providing power via High PoE, ensure that the lights on the midspan indicate correct operation. If they do not, see the midspan manual for further details. - Check to see if you can access a web page. - If you can, then cycle the camera's power off and on and check that the optical camera iris isn't closed. If this doesn't correct the problem, switch the Stream from Stream 1 or Stream 2 to M-JPEG. If this corrects the problem, re-install the latest Video SDK. - If you cannot, then you may have the wrong IP address. Use Configuration Manager to identify the correct IP address. <p>If OK, then check that there is 24 V output from the transformer.</p> <p>If OK, then check the integrity of all wires and mating connectors to the camera.</p>
Picture is dark (optical image).	<ul style="list-style-type: none"> - Check that the Gain Control is set to High. <p>If OK, then</p> <ul style="list-style-type: none"> - Check that the Auto Iris Level is set to the appropriate level.
Background is too bright to see subject (optical image).	Turn on backlight compensation.
Camera reboots frequently or intermittently	<p>Test your camera with another power supply.</p> <p>Check the Bosch website for a software update that might address the issue.</p>
No OSD messages appear.	Bosch's Video SDK is required. Video management software from third parties does not use the SDK.

Additional troubleshooting for MIC thermal imagers.

Problem	Explanation	Solution
A small square appears intermittently at the upper right of the video output.	This is the Flat Field Imminent Symbol. It warns that flat-field correction (FFC) is about to begin.	Do nothing; this is normal operation for the thermal camera.
The thermal image appears 'grainy'.	This often occurs when the temperature of the camera fluctuates, such as after the camera is powered on, or when ambient temperature is changing.	Wait for the camera to perform a flat-field correction (FFC).
The picture is dark.		Increase the Gain Level in the Camera > Picture Settings Thermal menu.
The contrast is too low.		Increase the Gain Bias in the Camera > Picture Settings Thermal menu.
The picture is too noisy.		If the camera is set to Manual contrast mode (in the Camera > Picture Settings Thermal menu), then reduce the manual contrast or switch to AGC mode. Reduce the Gain Level in the Camera > Picture Settings Thermal menu.
Details in the scene are washed out.		Change from Manual contrast mode to AGC mode in the Camera > Picture Settings Thermal menu.
The picture is not in focus.		Check that the objects that are not in sharp focus are within the allowed distance range for your model of thermal camera.
The picture shows images that aren't present in the scene.		Check to see if the heat of objects is being reflected off a surface, causing thermal reflections.

Customer Support and Service

If this unit needs service, contact the nearest Bosch Security Systems Service Center for authorization to return and shipping instructions.

USA

Telephone: 800-366-2283

Fax: 800-366-1329

Email: cctv.repair@us.bosch.com

Customer Service

Telephone: 888-289-0096

Fax: 585-223-9180

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Technical Support

Telephone: 800-326-1450

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Canada

Telephone: 514-738-2434

Fax: 514-738-8480

Europe, Middle East, Africa, and Asia Pacific Regions

Please contact your local distributor or Bosch sales office. Use this link:

<https://www.boschsecurity.com/corporate/where-to-buy/index.html>

15 Status Codes

For certain conditions, MIC cameras will display status codes on the video image. The table below identifies the status codes, their descriptions, and the recommended action to resolve the condition.

Most status codes appear on the OSD until you acknowledge them. The codes identified with asterisks (**) appear for approximately 10 seconds, then disappear automatically.

To clear the status code in the OSD, send the appropriate acknowledge command. If necessary, refer to the operation instructions in the Video Management System software for issuing acknowledge commands, or to the appropriate section in the User Manual for your MIC camera for details on issuing the “AUX OFF 65” command.

Status Code	Description	Recommended action (to be completed by a qualified Service Technician)
2	Capacity of external PoE device is insufficient to support operation of the camera's window defroster. Note: MIC IP fusion 9000i only.	An incorrect type of PoE (such as one based on IEEE 802.3af) with insufficient power output may be connected to the camera.*
3	Capacity of external PoE device is insufficient to support operation of the camera's internal heater.	An incorrect type of PoE+ or PoE++ (such as one based on IEEE 802.3af or IEEE 802.3at) with insufficient power output may be connected to the camera.*
4	Capacity of the external PoE device is insufficient to support operation of the camera's window defroster. Note: MIC IP fusion 9000i only.	An incorrect type of PoE+ or PoE++ (such as one based on IEEE 802.3af or IEEE 802.3at) with insufficient power output may be connected to the camera.*
5	When operating using redundant power sources, the camera is detecting insufficient voltage being provided by the external High PoE power source.	<ol style="list-style-type: none"> 1. Verify that the High PoE power source (midspan or switch) can provide 95 W of output power. 2. Verify that the Cat5e/Cat6e network cable is not longer than 100 m maximum. 3. If using the 95W High PoE Midspan (NPD-9501A), verify that both LEDs are green. If not, refer to the “Troubleshooting” section of the installation manual of the midspan.
6	When operating using redundant power sources, the camera is detecting insufficient voltage being provided by the external 24 VAC power source.	<ol style="list-style-type: none"> 1. Verify that the 24 VAC power source can provide at least 4.0 A to the camera. 2. Verify that the wire gage of the power cable is sufficient for the distance between the power source and the camera and that the voltage getting to the user cable of the camera is between 21 VAC and 30 VAC.

Status Code	Description	Recommended action (to be completed by a qualified Service Technician)
7	Camera may be operating in an environment where ambient temperature is below the specification of the camera.	<ol style="list-style-type: none"> 1. Verify that the ambient temperature is not below -40 °C (-40 °F). 2. Review the diagnostic log of the camera (accessible from the Service menu) for errors related to the operation of the internal heaters. <p>Note: Motorized zoom and focus functions of the visible camera lens will be disabled until the camera operates within the specified temperature range.</p>
8	Camera may be operating in an environment where ambient temperature is above specification of the camera.	<ol style="list-style-type: none"> 1. Verify that the ambient temperature is not above +65 °C (+149 °F). 2. Review the diagnostic log of the camera (accessible from the Service menu) for errors related to the operation of the internal fan. 3. Add the optional sunshield accessory to reduce internal heating caused by sun loading.
9	Camera has been subjected to high shock. Mechanical damage to the camera may exist.	<ol style="list-style-type: none"> 1. Verify the integrity of the mechanical parts such as the arms and the pan body. 2. Verify the integrity/tightness of the external fasteners. Tighten where necessary. 3. If obvious damage is present, stop using the camera and contact the nearest Bosch Security Systems Service Center. 4. If no damage is evident, power the camera off and then on, and then evaluate operational performance. If the camera does not operate as expected, contact the nearest Bosch Security Systems Service Center.

Status Code	Description	Recommended action (to be completed by a qualified Service Technician)
10	Camera is detecting high humidity level inside housing. The integrity of the housing seal may be compromised.	<ol style="list-style-type: none"> 1. Inspect the window for any cracks or obvious damage around the edge of the window. 2. Verify the integrity/tightness of the external fasteners. Tighten where necessary. 3. Verify the integrity of the mechanical seals around the tilt head, pan body, and arm joints. 4. If damage to the seals is obvious, contact the nearest Bosch Security Systems Service Center. 5. If no obvious damage is found, power the camera off and then on. If the status code reappears, contact the nearest Bosch Security Systems Service Center.
11	Wiper operation has been halted because of an obstruction.	<ol style="list-style-type: none"> 1. Remove any obvious materials that are obstructing operation of the wiper. 2. If the obstruction is from ice buildup, review the diagnostic log of the camera (accessible from the Service menu) for errors related to operation of the internal heaters (and the window defrosters, for MIC IP fusion 9000i). If possible, tilt the camera so that the front faceplate is pointed straight up. (In this position, heat generated by the camera will help to melt ice buildup from its front faceplate area.) 3. If the obstruction is from extreme ice buildup, temporarily avoid operating the wiper until internal heaters, combined with a rise in ambient temperature, melt the ice buildup.
12	Left and Right Pan Limits have been set too close to each other.	Re-configure one camera stop limit or the other to increase the distance between limit stops to at least 10° apart.
13**	Autofocus has been turned off because of excessive focus activity.	<ol style="list-style-type: none"> 1. If practical, increase lighting in the scene so that the focus function stops “hunting.” 2. Use focus in manual mode or One-Push mode.
14**	Washer operation was attempted without washer pre-position being stored.	Configure the washer pre-position. If necessary, refer to the subchapter “Using the Wiper/Washer (Bosch AUX/Pre-position Commands)” in the User Manual for details on configuring washer functions.

Status Code	Description	Recommended action (to be completed by a qualified Service Technician)
15	Attempt was made to move to a pre-position that is mapped to an alternate function, so it is no longer associated with a location.	<ol style="list-style-type: none"> 1. Select/configure a different pre-position number for the desired location. 2. Re-configure the pre-position assignment so that this number is no longer associated with an alternate function. Refer to the subchapter “Pre-position mapping” in the User Manual for details on re-mapping pre-positions.
16**	Motorized zoom function is programmed to operate at a high usage level in the Playback Tour. This high rate of usage could result in premature wear of the zoom motor.	Re-configure the camera to decrease the zoom activity to less than 30% during recording.
17	Motor operation has been halted due to an obstruction.	<ol style="list-style-type: none"> 1. Remove any obvious materials that are obstructing operation of the camera pan/tilt function. 2. If the obstruction is from ice buildup, review the diagnostic log of the camera (accessible from the Service menu) for errors related to the operation of the internal heaters (and the window defrosters, for MIC IP fusion 9000i). If the log notes heater or defroster failure, contact the nearest Bosch Security Systems Service Center. 3. If operation is obstructed because of excessive ice buildup, temporarily avoid operating the pan/tilt functions of the camera until internal heaters, combined with a rise in ambient temperature, melt the ice buildup.
18**	When operating using redundant power sources, the camera has detected a loss of power from the external High PoE power source.	<ol style="list-style-type: none"> 1. Verify the operating status of the external High PoE power source. 2. Verify the integrity of the electrical connections between the power source and the camera.
19**	When operating using redundant power sources, the camera has detected a loss of power from the external 24 VAC power source.	<ol style="list-style-type: none"> 1. Verify the operating status of the external 24 VAC power source. 2. Verify the integrity of the electrical connections between the power source and the camera.

Status Code	Description	Recommended action (to be completed by a qualified Service Technician)
20	Camera is configured to use the “Hard Pan Limits” (HPL) feature, and it has been powered-up with pan position in the forbidden zone.	Temporarily remove one of the hard pan limits (as described in <i>PTZ Settings, page 39</i>), pan the camera out of the forbidden zone, and then restore the hard pan limit. Reboot the camera by powering the camera off and then on, or by clicking the button Reboot in the camera’s web browser (Configuration > Camera > Installer Menu > Reboot device). Note: If pan movement is blocked only in one direction, but possible in the other direction (as when the camera is near the HPL), then no status code appears.
23	An internal error has occurred. (The optical video screen becomes blue for 1 or 2 seconds during the camera’s recovery procedure.)	If this problem begins to occur on a regular basis: 1. Verify that the power source to the camera is not experiencing brown-out conditions. 2. Verify that the camera’s earth ground connection is attached per earlier instructions. If these actions do not resolve this problem, contact the nearest Bosch Security Systems Service Center.

* **Note:** The MIC IP fusion 9000i camera requires a Bosch 95 W midspan (NPD-9501A) or a customer-tested/verified alternative.



Caution!

If you choose not to use a switch or midspan with the appropriate Power Sourcing Equipment (PSE) chip, then the MIC camera will not recognize the PoE as compliant, and the camera firmware may disable some or all functionality.

16 AUX Commands

AUX	Function	Command	Description
1	On/Off	Auto Pan without limits (Continuous)	
2	On/Off	Auto Pan between limits	
7	On/Off	Run Custom Pre-Position Tour	
8	On/Off	Run Pre-Position Tour	
18	On/Off	AutoPivot Enable	
20	On/Off	Backlight Compensation (BLC)	
24	On/Off	Video Stabilization	
40	On/Off	Restore camera settings [to factory defaults]	
43	On/Off	Auto Gain Control (AGC)	
50	On/Off	Playback A, continuous	
51	On/Off	Playback A, single	
52	On/Off	Playback B, continuous	
53	On/Off	Playback B, single	
57	On/Off	Night mode IR Filter In/Out	
60	On/Off	On-Screen Display (OSD)	
61	On/Off	Preset & Sector Titles Camera Block Overlay VDSK not required	
65	Off	Alarm Acknowledge	Acknowledges alarm events/rules or deactivates physical outputs.
67	On/Off	IR Focus Correction	
78	On/Off	Intelligent Tracking	
80	On/Off	Digital Zoom lock	
86	On/Off	Sector Blanking	
87	On/Off	Privacy Masking	
88	On/Off	Proportional Speed	
94	On/-	Recalibrate Azimuth Compass	
95	On/Off	Azimuth/Elevation Display	
96	On/Off	Compass Points Display	
100	On/Off	Record Tour A	
101	On/Off	Record Tour B	
102	On/Off	Wiper On/Off (Continuous)	

AUX	Function	Command	Description
103	On/Off	Wiper On/Off (Intermittent)	
104	On/Off	Wiper On/Off (One shot)	
105	On/Off	Wash/Wipe On/Off	
121	On/Off	Left Hard Pan Limit	
122	On/Off	Right Hard Pan Limit	
123	On/Off	Clear Hard Pan Limits	
606	On/Off	Power Mode	
700	On/Off	Proportional speed control adjustment	Aux On, entered repeatedly, cycles through increasing speeds Super Slow, Slow, Medium, and Fast. Aux Off, decreases speeds through the same settings.
804	On/Off	Mask Calibration Procedure	
908		Increase Privacy Mask Size while moving	
1-256	Set/-	Pre-position Programming	
1-256	-/Shot	Pre-position Recall	

The following commands are specific to MIC IP fusion 9000i models.

AUX	Function	Command
454	On/--	Activate color mode White hot
454	--/Off	Activate color mode Black hot
455	On/--	Activate color mode Flamma Arcticus
455	--/Off	Activate color mode Red light
456	On/--	Activate color mode SoftLight
456	--/Off	Activate color mode Memoriam
457	On/--	Activate color mode Rainbow
457	--/Off	Activate color mode Ocean
458	On/--	Activate color mode Sunset
458	--/Off	Activate color mode Rain
459	On/--	Activate color mode Arcus
460	On/--	Activate color mode Inferno
467	On/--	Execute Flat-field correction

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